The Mining Journal

LONDON, NOVEMBER 2, 1956

Vol. 247. No. 6324. Price Ninepence

Manufacturers of Railway Switches and Crossings
Design, Manufacture, Installation and Maintenance of Heavy and Light Permanent Way Materials: Rails, Chairs, Sleepers, Tools and fittings: Wagons, etc. For Standard and non-standard track at Home and Abroad.
Cutting rail during switch manufacture.
WILLIAM JONES LTD
ADAM HOUSE, ONE FITZROY SQUARE, LONDON, W.1.
Telephone: EUSton 7871 (7 lines)
Grams: Dianthus-phone London
Works: Westmoor Street, Charlton, S.E.7.

The results of your work depend on the choice of your tools!

the choice is yours

from a large assortment

of first class drilling materials

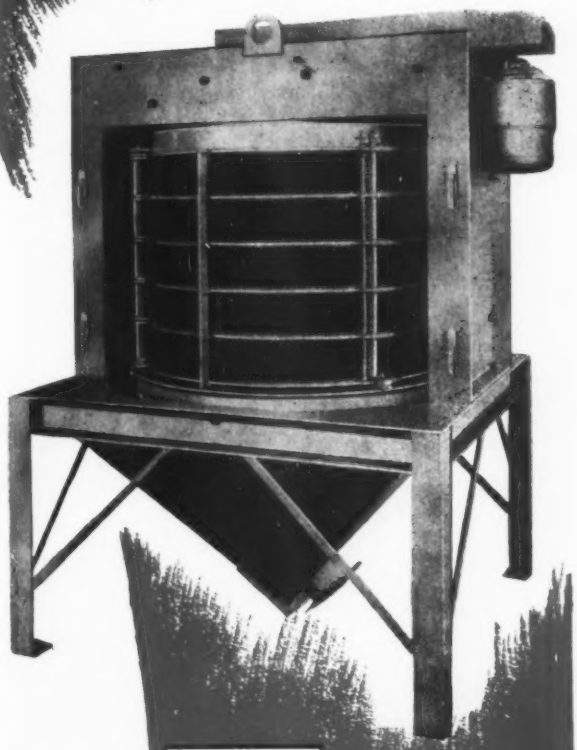
embodying half a century of technical experience

Ask for free catalogues

Conrad Stork
HAARLEM - HOLLAND

AGENTS: RICHMONDS (LONDON), LTD
FINSBURY PAVEMENT HOUSE,
120 MOORGATE, LONDON E.C. 2

The Drum that **FANS** *the Fines!*



For fine screening—effective fine screening—gravity is not enough. The increasing demand for finer and finer material necessitates a more positive method of separation.

The Symons V Screen uses the enormously greater power of centrifugal action. Its vertical drum, revolving at high speed, gyrates *fourteen times per revolution.* Material for screening is flung by the feedplate against the inner surface of the drum, the undersize being ejected through the screen by centrifugal force.

Each gyration of the drum produces an inward alternating with an outward movement of the material being screened, so freeing the screen holes. The feed is thrown outwardly against the drum, and then deflected inwards, once each gyration; this gives fast, uniform screening.

The Symons V Screen is in use all over the world, for high-capacity fine screening, both wet and dry. When washing is necessary, the screen is equipped with an internal spray. For dewatering, the centrifugal action turns out a much drier product. And in dry screening, the natural fanning action carries the 'air float' fines through with the undersize—hence the Symons Screen's high efficiency in dealing with lightweight material.

SYMONS V Screen

NORDBERG MANUFACTURING COMPANY
19 CURZON STREET, LONDON, W.1., ENGLAND
Cables: Nordberg, London
Head Office and Works: MILWAUKEE, WISCONSIN, U.S.A.

PUBLIC WORKS & MUNICIPAL SERVICES EXHIBITION OLYMPIA 12-17 NOV. 1956

VISIT OUR STAND No. 39G

SYMONS . . . A REGISTERED NORDBERG TRADE MARK KNOWN THROUGHOUT THE WORLD

NORDBERG MACHINERY BUSCH-SULZER A DIVISION OF NORDBERG

NORDBERG THE WORLD OVER

JOHANNESBURG, 42 Marshall Street

MEXICO, D.F. Post Box 7816

There's no escaping it– Wrought Iron is safer

All threats to human safety are not as clearly evident as this one. Many daily dangers are unseen and unsuspected—such as the possibility of failure by couplings, cable chains and cage and lifting gear. *Where equipment of this kind involves the lives of men and women, it is safer to specify Wrought Iron.*

Wrought Iron is very tough indeed. Its shock and strain resistance is outstanding. Its ability to withstand rust and corrosion is well known. And its inherent susceptibility to welding is intensified by slag inclusions. These qualities add up to an all-round, long-term superiority to mild steel for many purposes, in both safety and economy—especially where wet or outdoor conditions are concerned. At the Midland Iron Works we produce Wrought Iron in strips and bars, and in a variety of sections, for innumerable uses. We will gladly send you a free copy of our Section Book, and our technical representative is at your service for consultation on Wrought Iron application.

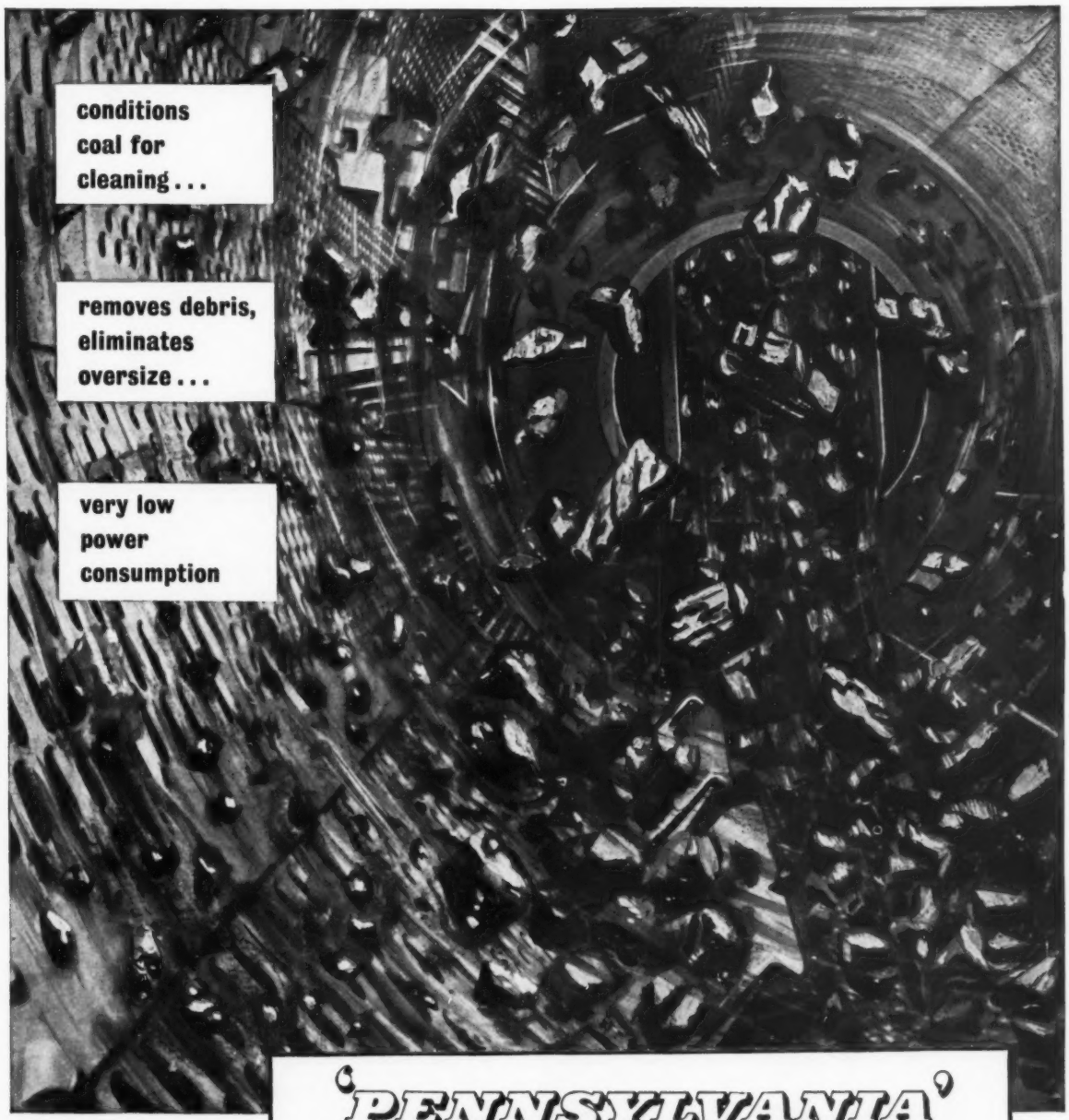
This nick-and-bend test piece clearly shows the fibrous structure of Wrought Iron, which gives it its high durability, shock-resistance and ability to absorb varying stresses and withstand severe vibrations. Wrought Iron is also distinguished by its ductility and exceptionally good machining properties.

The Midland Iron Co. Ltd

MIDLAND IRON WORKS · ROTHERHAM

...you can safely use Wrought Iron for a host of purposes

MI/8



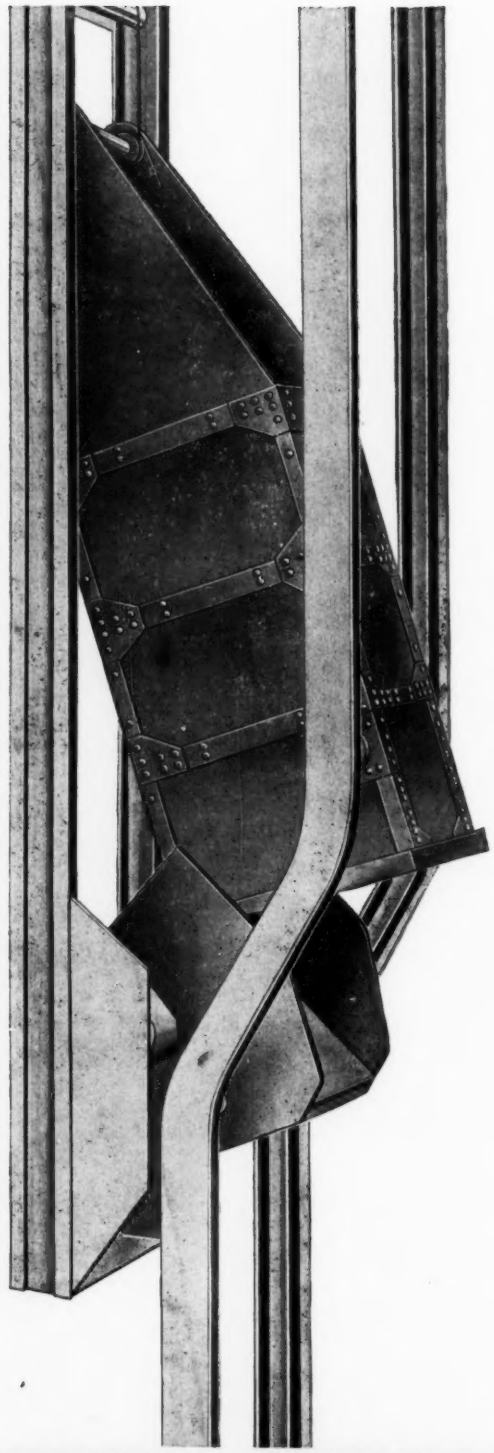
'PENNSYLVANIA'
BRADFORD BREAKER

The coal is fed into the loading end. Passing sizes are immediately screened out through the screen plate perforations. Larger lumps are raised by means of radial lifting shelves and dropped at some point where the shelf inclines sufficiently in its circuitous route. Gravity impact breaks the material as it falls on the perforated screen plates, passing sizes are screened out and the larger lumps are again lifted on the shelves — repeating the action until all the material passes from the cylinder except the refuse, which is scavenged and passed out the discharge end.

FRASER & CHALMERS

FRASER & CHALMERS ENGINEERING WORKS
ERITH · KENT

THE GENERAL ELECTRIC CO. LTD., OF ENGLAND — FC74



a cleaner discharge in less time

The Saunders skip provides advantages not obtainable with overturning or other bottom discharge types. The evolution of a satisfactory bottom door which operates smoothly and gives a complete and clean discharge of the contents, even with damp-fines, is the outstanding feature. The closure of the door is positive and locking. The discharge point is always beyond the edge of the discharge chute. Saunders skips have been supplied to South African Gold Mines and other installations, and can be made of any capacity and to suit all compartment or shaft sizes.

Saunders bottom dump skips

HEAD WRIGHTSON & CO LTD

THORNABY-ON-TEES • STOCKTON-ON-TEES • MIDDLESBROUGH • LONDON • Overseas: JOHANNESBURG • TORONTO • SYDNEY, N.S.W.

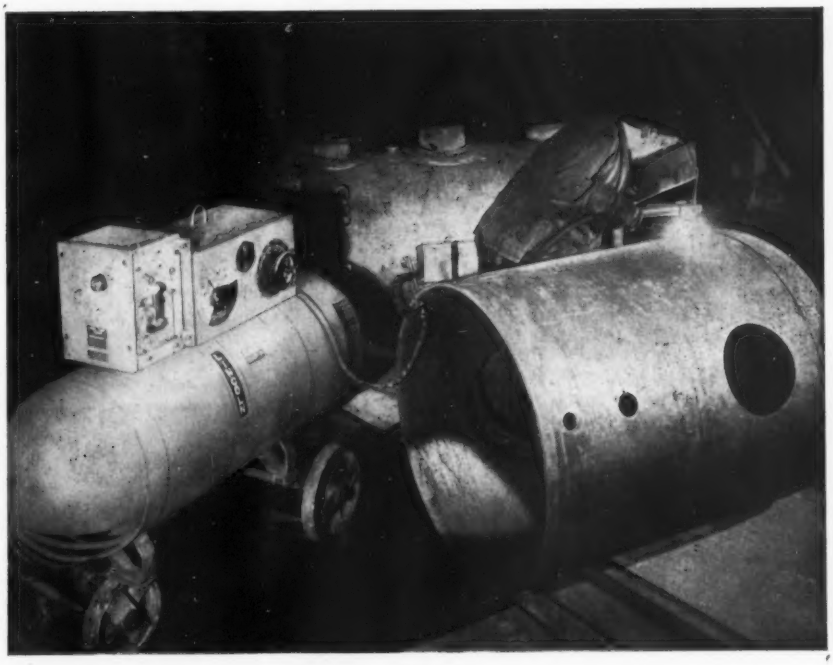
3614

THE *Arcair* TORCH

SAVES UP TO 80%

on gouging, grooving, cutting

- *Works on all metals*
- *Many times faster than chipping*
- *Low initial cost—low operating cost*
- *Will operate off any standard D.C. Lincoln welding machine and compressed air*
- *Cuts clean — no further preparation necessary for welding*
- *Easy to operate—no special skill required*
- *Write for full information to sole European manufacturers and distributors, Dept. M.J.*



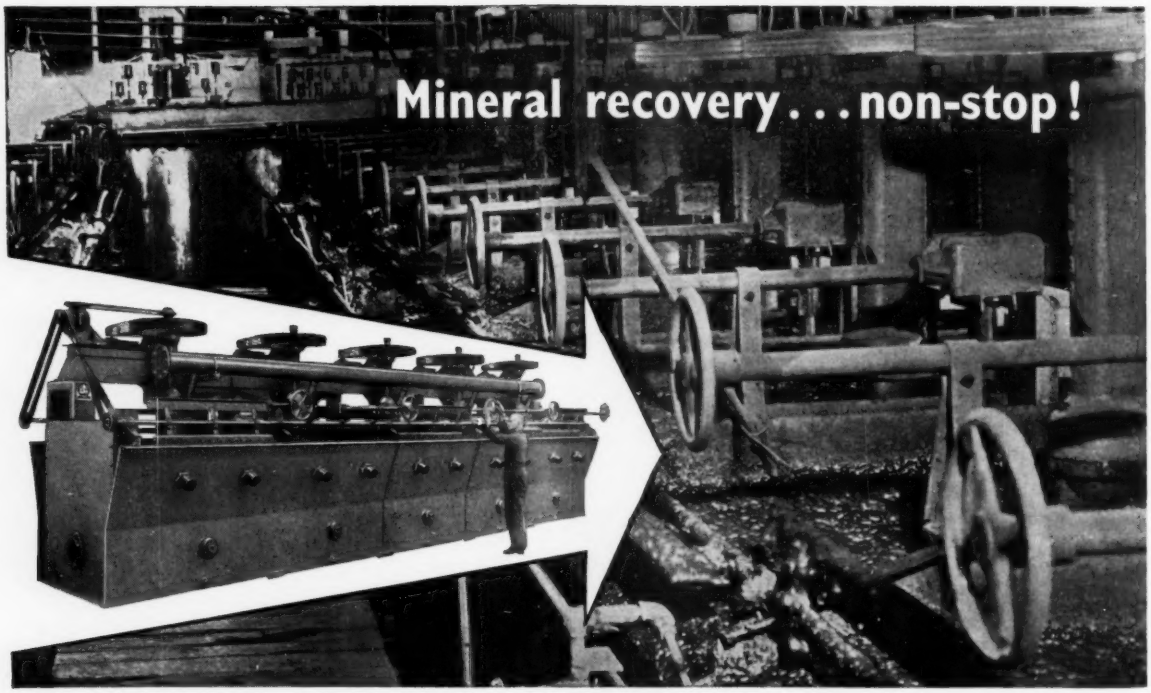
The Empyrium Welding and Manufacturing Co., Ltd of Birmingham cut and gouge with the Arcair torch, here seen being used on Air Receivers for the Automobile Industry. Cutting back and gouging welds is seldom necessary because, as they say, 'they have an excellent bunch of welding operators who do a 100% job with Lincoln Electrodes and Lincolnweld Automatic Welding equipment'. Nevertheless, they recommend this 'excellent tool' when the occasion arises.

The ARCAIR TORCH is a light, mobile tool that can be operated in a restricted space and in any position. It works on *all* metals and can be used for gouging defects, removing unwanted metal, cutting, grooving and shaping ferrous or non-ferrous metals. The depth of cut is easily regulated, welding or brazing can be done without further grinding or cleaning and slag from welding does not interfere with cutting action. The electrodes are quickly adjustable to any angle. No gas cylinders or regulators are necessary. *Outstanding for speed and economy, the* ARCAIR TORCH *has wide applications throughout industry.*

PUT AN *Arcair* TORCH TO WORK NOW!

LINCOLN ELECTRIC CO LTD · WELWYN GARDEN CITY · HERTS · WELWYN GARDEN 920

AAA



24 hour service DENVER 'Sub-A' FLOTATION

The sub-aeration ('Sub-A') principle employed in Denver machines is a vital factor in producing maximum high grade recoveries, because it allows such a high degree of selectivity and flexibility in operation. A further outstanding feature of the 'Sub-A' is its rugged mechanical simplicity of construction which gives freedom from shut-downs and allows a "24 hours per day service" to be maintained.

For full information send for Bulletin F10/B81.

DENVER Reagent FEEDERS

for accurate control of flotation pulp reagents

Accurate reagent control of flotation is essential if maximum metallurgical returns are to be obtained. Denver Reagent Feeders provide this control.

After positive fine adjustment, accurate regulation is maintained at all times, and reagents are kept thoroughly mixed to prevent packing, stratification and settling out of solids.

Two types available—Dry Cone type (illustrated) and Wet Multi-compartment. Bulletin F9/B8 contains full information.

"The firm that makes its friends happier, healthier, and wealthier"

DECO STANDARD RELIABLE 24 HOUR SERVICE EFFICIENT

FLOTATION ENGINEERS

DENVER EQUIPMENT CO. LTD

15-17 CHRISTOPHER STREET · FINSBURY SQUARE · LONDON E.C.2.

Telephone : BIShopsgate 3575. Cables : 'DECOLON' London

DENVER · NEW YORK · CHICAGO · EL PASO · VANCOUVER · TORONTO · MEXICO D.F. · LONDON · JOHANNESBURG · RICHMOND

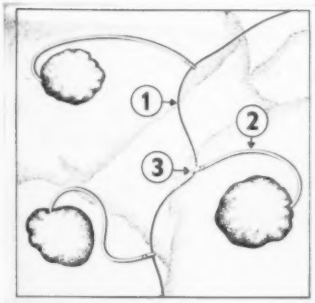
TIb 90

NEW

PLASTIC IGNITER CORD

Makes Plaster-shooting simpler and safer

'Slap-dabs', 'Spider-shots', or 'Mud-capping', call it what you like, Plastic Igniter Cord makes the job a lot easier—and safer. Now, only one ignition is needed to fire a number of shots—no more scrambling to safety over rock-piles after lighting-up a lot of awkwardly placed fuses. Plastic Igniter Cord gives *reliable* ignition, lights easily, and burns readily even under wet conditions. This important new development is a valuable aid to more efficient blasting operations.



1. *Plastic Igniter Cord*
2. *Safety fuse*
3. *Igniter Cord Connector*

Write to your nearest I.C.I. Sales Office for the new booklet that gives full information on Plastic Igniter Cord.

ICI

IMPERIAL CHEMICAL INDUSTRIES LIMITED

NOBEL DIVISION, 25 BOTHWELL ST., GLASGOW, C.2

N.63

. . . any problem connected with rope

British Ropes Limited have made it their business, not only to make all kinds of rope, but to know a very great deal about rope in all its many applications. Thus, it is a wise move to approach British Ropes Limited for the help and expert technical advice that they will gladly bring to bear on any problem connected with rope.

ROPES OF STEEL WIRE, SISAL, MANILA, HEMP, NYLON AND OF 'TERYLENE' POLYESTER FIBRE.

BRITISH ROPES LIMITED

K.

The Mining Journal

London, November 2, 1956

In this issue . . .

Handling Equipment for India	521
More News from Eire	552
Metals at the "Atomic Fair"	523
The Coal Miners' Claims	523
Mining Machinery in New Zealand ...	523
First Coal Preparation Plant in Australia	524
Scraper Box Ploughing and Slicer Loading	526
Consolidated Zinc's First Half Century ...	528
Machinery and Equipment	529
Mining Miscellany	530
Metals and Minerals	532
London Metal and Ore Prices	534
Mining Finance	535
Company Meetings	537

Vol. 247 **No. 6324**

Established 1835

Joint Editors
U. Baliol Scott R. Bruce Dunfield

News Editor A. G. Thomson
Financial Editor I. M. Moseley

Assistant Editor
R. Bowran

Display Advertisement Manager
E. S. Hooper

Circulation
Robert Budd

Published each Friday by

THE MINING JOURNAL LTD.

Directors
E. Baliol Scott *(Chairman)* U. Baliol Scott *(Managing)*
G. A. Baliol Scott

15, WILSON STREET, LONDON, E.C.2.

Telegraphic Tutwork London
Telephone MONarch 2567 (3 lines)

Annual Subscription £2 5s. Single copy ninepence

Handling Equipment for India

EXPANSION of mining and heavy industry is the basis of India's massive programme of economic development, for which an expenditure of Rs.7,200 crores (roughly £5,400,000,000) is envisaged in the five years 1956-57 to 1960-61. Coal production is to be raised during this period from 38,000,000 to 60,000,000 tons and that of iron ore from 4,300,000 to 12,500,000 tons.

An indication that India might have to raise coal production to 150,000,000 tons in the third Five-Year Plan to meet the increasing requirements of industry and other developments was given by Mr. K. C. Reddy, Minister for Production, government of India, when he inaugurated the newly constituted Coal Council in New Delhi. Mr. Reddy emphasized that the target of 60,000,000 tons set for the second Five-Year Plan was regarded as only a modest beginning for much larger increases. He said that it had already been decided by the government that all metallurgical coal should be washed and reserved for metallurgical and similar purposes. The production of low-grade coal had to be stepped up to prevent the use of metallurgical coal for non-metallurgical purposes.

Good metallurgical coal reserves in India are estimated at about 700,000,000 tons and at the existing rate of consumption should be sufficient for another 12 years. Our Indian Correspondent points out they might last a little longer if use is made of the metallurgical coal at Bokaro. Reserves of good coking coal at the Giridih State Collieries are reported to be very limited and are not likely to last more than a decade. Giridih coal is capable of yielding coke suitable for producing calcium carbide. At present India produces only 3,000 tons of calcium carbide annually against imports of 8,000 tons. The requirements of calcium carbide during the second Five-Year Plan are over 24,000 tons.

It is estimated that Rs. 300,000,000 worth of machinery will have to be imported to implement the programme of increasing the coal output from 38,000,000 tons a year to 60,000,000 tons. The U.S.S.R. has offered the government of India assistance in establishing a plant for the manufacture of coal mining machinery and equipment in the country. At the same time, prospects of importing coal mining equipment are being explored. The government recently purchased 25 drills from the U.S.S.R. and another 40 drills are expected from the same source.

A large share of the additional output projected under the second Five-Year Plan is to be secured by the opening up of new collieries under public ownership. Government spokesmen have said that these collieries will be "on the most modern lines". Presumably they will make full use of mechanical equipment such as wagon hoists, tipplers, gantries and conveyors. Of considerable importance, therefore, is a report issued by the Export Services Branch of the U.K. Board of Trade on the market in India for lifting and conveying equipment (Ref.: ESB/18383/56), in which due attention is given to the potential requirements of the coal mining industry.

There are a number of Indian manufacturers of lifting

equipment. The most prominent manufacturer of cranes is Jessop & Co., Ltd. Keen competition also exists among exporters in the supply of most types of cranes to India. Some countries have scored notable successes, among them being Yugoslavia and West Germany.

A factor of more importance for conveying equipment than for lifting equipment is that, when giving orders for processing plant, Indian industrialists tend to place a complete order for the plant and its ancillary conveyors. To the extent that the processing plant of other countries has any competitive advantage over that of the U.K., orders for the conveying elements in the unit might thus go to the supplier of the processing plant or his associate, without separate consideration being given to the relative advantages of U.K. conveying equipment.

Of the 38,000,000 tons of coal dug in India in 1955, only about 1,300,000 tons was conveyed mechanically. According to official figures there are about 90 mechanical conveyors in use in India having an aggregate length of 29,080 ft. It is reasonable to anticipate that the new State collieries will be equipped with a full range of modern conveying plant.

A fair amount of conveying equipment is made in India. On the other hand, foreign competition in the conveyor field seems to be much less powerful than it is for cranes. It is understood that nearly all the mining conveyors in use in India have been supplied by the U.K. It cannot be long, however, before manufacturers in other countries realize the potentialities of the Indian market and set out to obtain a share of it.

In view of the tendency to place composite orders for processing and conveying plant, it may be of advantage if composite offers can be made. For example, conveyors for mines can be linked with crushing and screening plant. This association can be achieved by the U.K. supplier of handling equipment either by making suitable arrangements with other U.K. manufacturers, or by appointing an agent who handles the types of processing plant which, in use, are often conjoined with conveyors.

There are about 100 aerial ropeways in India. British manufacture is predominant. One U.K. firm estimates that it has supplied about 50 installations to India. They are used for convenience — e.g., for straight runs from river beds to mines carrying sand for stowing, or from mines to railheads or washing plants — or when ground conditions are against railtrack or roads, as in hilly regions or forests. Ropes, drive cabins, etc., are usually imported, but steelwork is often fabricated locally.

Foreign suppliers have recently shown interest in the possibilities of selling ropeways to India. A composite tender for a coal washing plant at Bokaro (Bihar) included ropeways of Japanese manufacture. Skoda, of Czechoslovakia, have been actively pursuing an order for a 78-mile long ropeway in Assam. A West German firm has also looked into this project.

MORE NEWS FROM EIRE

The progress of Eire's rejuvenated mining industry was reviewed in our issue of October 19, 1956 (p. 456). During the past two weeks additional information regarding various undertakings has been made available and further developments have been reported.

The Emerald Isle Mining Co. Ltd.—a subsidiary of the Can-Erin Mining Corporation of Toronto—has announced "excellent copper values" from additional copper ore samples obtained from underground drifts and stopes in the company's Mountain Mine at Allihies, County Cork. Bulk samples taken underground at the Mountain shaft and Urhin zone ran 5.60 per cent and 6.05 per cent copper respectively.

The old main shaft at this mine has been carried to a depth of 1,800 ft., where it stopped in ore described as "extremely rich". The equipment employed has now reached the limit of its usefulness. Additional rigs are to be brought from Canada to continue the exploratory drilling operations in this shaft.

Fifty men are at present employed at Allihies, where de-watering operations are in progress. It is reliably understood that difficulties are being encountered in the de-watering process and extra pumping equipment may have to be imported in order to speed up this work.

Five channel samples and one chip sample from the east-west stope on the 270-ft. level at the Allihies Mine—which de-watering operations have now made accessible—have returned the following values: Sample No. 1 (chip) 0.62 per cent copper; sample No. 2 (channel) 1.63 per cent; sample No. 3 (channel) 2.33 per cent; sample No. 4 (channel) 3.38 per cent; sample No. 5 (channel) 2.15 per cent; sample No. 6 (channel) 2.93 per cent; sample No. 7 (grab sample from tailings dump) 0.17 per cent.

Drilling of flat holes from both levels now de-watered is being begun immediately to outline the dimensions of the various lodes. No drilling was done by former operators of the mine, so that parallel zones indicated by the current drilling programme are entirely unexplored. Two deep drill holes from the surface at the Urhin and Caminches zones are reported to be making excellent progress.

A new company known as Bonmahon Copper Mines Ltd., with a nominal capital of £40,000, has been formed to develop the old copper mines at Bonmahon, County Waterford, referred to in our issue of October 19. The names of the directors have not been disclosed, but it is understood that the group is an Irish one and that at present no Canadian or foreign interest is involved. It is further reported that this group intends only to carry out initial exploratory work and de-watering of the old shafts, and that the property will then be offered to another interest.

Local interests are seeking to have the old copper mines at two areas near Killarney reopened. The mines are located at Muckross and Ross Island and have not been worked for over a century. The Minister for Industry and Commerce has so far rejected suggestions that they might be reopened, on the ground that mining operations might lead to serious damage to tourist amenities in the area. Killarney Trades Council is at present seeking to have these mines surveyed by a Canadian mining expert.

Saint Patrick's Mining Co., of Avoca, a subsidiary of the Mogul Mining Corporation of Toronto, has been asked by local interests at Gortahork, County Donegal, to undertake a survey of old silver and copper mines at Keeldrum, West Donegal. These mines have been derelict for almost a hundred years, when an English concern ceased production because of falling copper and lead prices. It is understood that samples taken from the old workings a short time ago were found to have payable values.

The Minister for Industry and Commerce, Mr. Norton, stated recently in Parliament that his department had received proposals for prospecting facilities in certain parts of County Kerry. These, however, were still under consideration. The Minister was replying to a question asking whether he had granted mining facilities to a Canadian mining firm in areas of South Kerry. Deposits of copper, lead and zinc are known to exist in several parts of the county.

A few weeks previously the Minister announced that

mining interests were prepared to spend £150,000 on exploratory work in three areas, one of which was East Kerry. It is, therefore, deemed likely that two distinct groups are now seeking prospecting facilities in the county.

A company to be known as Saint Kevin's Lead and Zinc Mines Ltd. has been formed for the further exploration and development of the old lead and zinc mines at Glendalough, County Wicklow. The new company is a wholly-owned subsidiary of Wicklow Mining (Canada) Limited and the Mogul Mining Corporation of Canada. A statement issued says that the new company has already begun a programme of exploration and development drawn up by geologists engaged by the company, and tunnelling is already under way at Glendalough.

METALS AT THE "ATOMIC FAIR"

Many well-known firms in the U.S. metal industry were among the 120 companies that displayed their products and services at the 1956 Trade Fair of the Atomic Industry, which took place recently in Chicago. That such an event should have been staged is in itself a convincing indication that the atomic era is no longer round the corner but has actually arrived.

Products of the steel industry made an impressive showing at the Fair. They included stainless steel for use in structurals and equipment for research and production of atomic energy and radioactive isotopes; clad steels having high resistance to corrosion and oxidation, which are used in gauge pressure vessels and heat exchange; and both light and heavy gauge stainless clad steel pipe for high pressure piping in reactor systems.

The shielding materials on view included lead in various forms as well as concrete densified with barite, magnetite and lead. Other applications featured for lead were isotope shipping casks, lead bricks, and reactor and hot cell components.

Fabricated zirconium components for atomic reactors were shown, as well as samples of zirconium sheets, strip, sponge and ingots. Another stand was devoted to nuclear grade barium oxide shapes and nuclear grade barium metal. There was also a display of pure beryllium metal, beryllium oxide crucibles, and other beryllium products.

One leading firm exhibited what it called its "service across the board in atomic energy; for mining, milling, processing and refining uranium through engineering and construction of nuclear facilities."

It is evident from these displays that the atomic industry has already made its impact on a wide section of the mining and metal industries.

THE COAL MINERS' CLAIMS

So far this winter the British Union of Mineworkers has stood back in the scramble for higher wages and has concentrated on the achievement of "fringe" benefits, these demands including shorter working hours, sick pay and pension improvements and the removal of the bonus shift penalty clause. This latter was introduced several years ago in an endeavour to discourage absenteeism, and essentially involves the payment of an additional shift's wages only to those miners who work the full five-day week. For some considerable time the N.U.M. have been pressing that the bonus shift be abolished and an additional one-fifth daily wage be paid for each shift worked irrespective of the number of shifts worked in any one week.

In view of the pressing need for more coal the abolition of the attendance clause may well give rise to a serious situation precipitated by an increase in voluntary absenteeism. Whilst this may be undesirable economically, the retention of the bonus shift as it exists at the moment is wrong in that it penalizes only one section of the industrial community. So much has been written about voluntary absenteeism in the mines by newspaper correspondents who themselves have a perpetual record of 100 per cent absenteeism underground that the picture has been distorted out of all recognition. Voluntary absenteeism per miner at the moment amounts to one shift per month, rather less than twelve shifts per year. How does this compare with other industries? Significantly no figures are published—or indeed are procurable — but many workers in less onerous employment religiously utilize their full quota of sick pay leave and enjoy three or four weeks' annual holiday.

Whilst there can be no doubt that the prospect of losing two days' pay for one day's voluntary absence does discourage absenteeism the problem is not so much in getting miners to their place of employment but rather in ensuring that they do a full day's work once they get there.

Perhaps the current talks between the N.C.B. and the N.U.M. will provide a solution but it is obvious that the satisfactory answer lies in the attainment of higher production per manshift.

MINING MACHINERY IN NEW ZEALAND

A steady reduction in imports of mining machinery over the past few years is noted in an economic survey of New Zealand by the U.K. Senior Trade Commissioner, D. A. Bryan, O.B.E. (H.M.S.O., 10s. net). This has been due to a change in the method of mining. Open-cast operations are now more frequently employed and much of the machinery required for this type of work falls under the heading "excavating equipment".

In 1954 total imports of mining machinery into New Zealand were valued at £166,000 compared with £364,000 in 1952. It is noteworthy that despite this drastic decline in total imports, purchases from the U.K. showed little change in value, amounting to £83,000 in 1954 against £84,000 in 1952. Imports from Australia actually increased in value from £38,000 in 1952 to £45,000 in 1954. On the other hand, the U.S. supplied only £27,000 worth of machinery in 1954 against £193,000 in 1952.

Two-thirds of the total imports in 1954 consisted of rock drills for blasting purposes and diamond drills for exploration and deep drilling. One of the main uses of diamond drills in New Zealand is in the filling of poor rock with cement to give greater stability and for this application Australian drills are widely used. Much of the American equipment brought into New Zealand has been used in geothermal boring operations. Compressors, which are widely used in mining operations, are not included in the figures given above. Supplies are derived almost exclusively from the U.K. and average nearly £200,000 per annum in value.

There is considerable local manufacture of mining equipment; notably conveyors, winding machines and stampers. Owing to this production mining machinery generally is subject to import control. Applications are considered individually, but licences are granted freely for plant with no locally made equivalent. The government, through the Ministry of Works and the Mines Department, is the largest purchaser of mining machinery.

Chance coal washing plant at Corrimal on the plain below the drift mouth

First Coal Preparation

THE coal preparation plant at Corrimal Colliery, New South Wales, has a capacity of 200 tons per hour of 6 in. sq. x 0 raw coal. The scope of the contract given The Fraser and Chalmers Engineering Works of The General Electric Co. Ltd. covered the whole of the civil engineering work, steel-framed building, bunkers, belt conveyors, driving motors, control and distribution gear, transformers, lighting and power wiring installation, in addition to the whole of the washery plant and ancillary equipment. The Corrimal plant is the first coal preparation plant in Australia.

Due to the ground contours, it was impracticable to bring railway sidings up to the drift, and the coal preparation plant has been constructed about a mile away on the plain below, about 426 ft. lower than the level of the mouth of the drift. This feature necessitated special consideration being given to the raw coal handling arrangements between the drift and the plant.

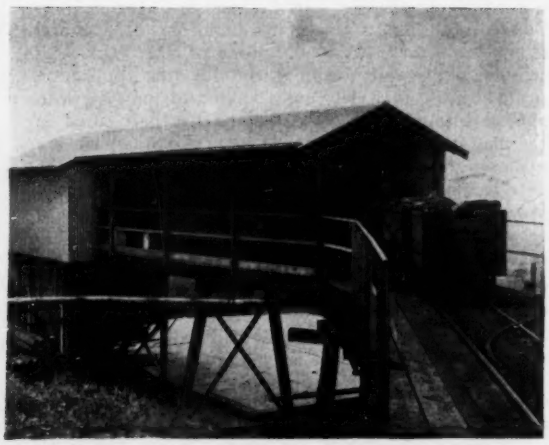
In all there are seven seams of coal on the property, which range from 4 ft. to 10 ft. in thickness. At present the No. 1 or Bulli seam is worked, and this is under cover of 300 ft. to 1,500 ft. with a dip of 1 in 50 in a north-westerly direction. The coal is a semi-bituminous, short-flaming, coking coal, and it burns with a marked freedom from clinker. The calorific value is about 13,000 B.Th.U.'s per lb., and it is relatively soft and free from dirt bands.

The coal has a relatively high inherent ash content, of the order of 12 per cent, and the introduction of machine mining increased the total ash content to about 20-25 per cent. It was therefore decided to investigate the possibility of upgrading the coal by washing, and it was decided to install a plant embodying the Chance process.

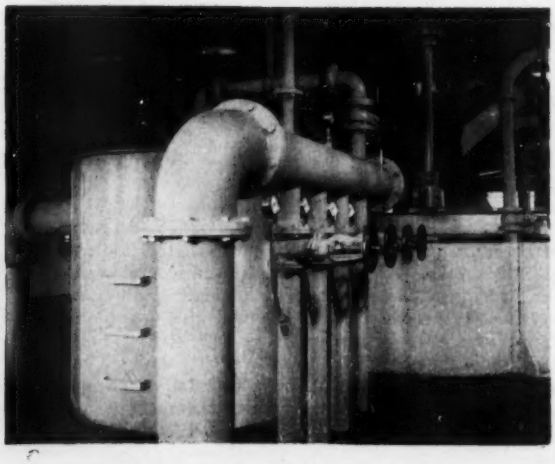
The raw coal is brought up the drift in skips of approximately 30 cwt. capacity, by means of a steam haulage engine. After uncoupling from the haulage rope, the skips gravitate to a rotary tippler, from which the raw coal is discharged into a surge bin. The latter is provided with a feeder, fitted with a bar grizzly at the discharge to pass a 6 in. product. The oversize material, i.e. the plus 6 in., is discharged into a single-roll crusher for reduction to minus 6 in. after which it joins the natural 6 in. x 0 fraction on a belt conveyor. The latter delivers the 6 in. x 0 into a 100-ton capacity bunker.

A haulage-way is supplied for lowering the raw coal down the incline from the colliery to the coal preparation plant. Two skips, each having a capacity of 15 tons, are fitted at each end of the haulage rope. The drive is automatic, and once the start push button has been pressed, the skips are accelerated to their normal speed, and then de-

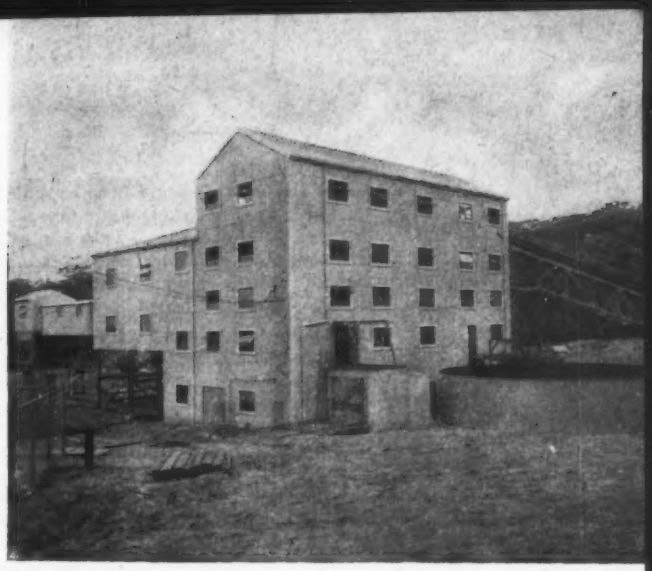
Skips awaiting discharge by rotary tippler into the surge bunker



A Chance cone with control valves shown in the foreground



The first coal preparation plant in Australia, constructed at the Corrimal Colliery of the Corrimal Coal and Coke Pty. Ltd., was installed by The Fraser and Chalmers Engineering Works of The General Electric Co. Ltd.



A general view of the Corrimal coal preparation plant

celerated and brought to rest, without any further action on the part of the operator. The 100-ton capacity bunker mentioned above is fitted with power-operated doors for filling the skips as they reach the top of the incline.

On reaching the bottom of the incline, the skips run over the top of a 200-ton capacity bunker. Power-operated bottom discharge doors are fitted to each skip to enable

Plant in Australia

the contents to be discharged into the bunker. The latter is fitted with a scraper-feeder to regulate the rate of feed to the washery.

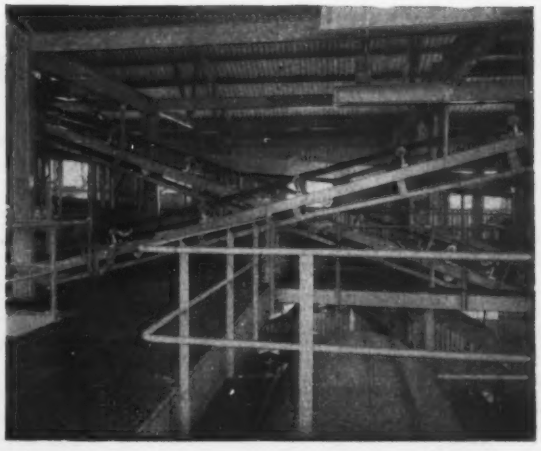
The coal is delivered to the plant by means of a 30 in. wide belt conveyor. The latter discharges the 6 in. x 0 raw coal on to the primary raw coal screen, where it is separated with the aid of spray water into 6 in. x ½ in. and ½ in. x 0. The latter fraction is laundered with the aid of the spray water added on the primary raw coal screen, to two Sherwen high-speed electro-magnetically vibrated screens for further wet screening into ½ in. x ⅛ in. by ⅛ in. x 0. The 6 in. x ½ in. fraction is delivered directly into the Chance washing cone, together with the ½ in. x ⅛ in. fraction from the Sherwen screens, by way of conveyors. All the spray water added on the primary and Sherwen screens which contains the ⅛ in. x 0 fraction flows on to two high-speed zimmer type screens for dewatering.

The Chance cone which is 10 ft. 0 in. in dia., has been designed for a single gravity separation with products of clean coal and refuse. Provision has been made for the cone to be converted to make a two-gravity separation for producing clean coal, middlings and refuse if required in future. The connection on the cone for the middlings column has been blanked-off for the time being, but the middlings column can be fitted in a very short time without structural alterations.

Refuse extracted from the Chance cone is desanded and dewatered on a shaker type screen and is delivered to a 20-ton capacity bunker for disposal, via a conveyor. Mean-

A skip discharging its contents into 200-ton capacity bunker

Interior view showing belt conveyors with spillage troughs



while, the clean coal is also desanded and dewatered on a shaker type screen which is also arranged to grade the coal into the following sizes : 6 in. x 3 in., 3 in. x 1 in., and 1 in. x ¼ in. The first two sizes mentioned are loaded into rail wagons by means of chutes, while the latter size is discharged on to a conveyor and then loaded to wagons.

The ¼ in. x 0 fraction of the raw coal feed is laundered, together with all the spray water added on the primary and Sherwen screens, to the two zimmer type screens. Here the coal is dewatered and separated at a nominal size of ½ mm., the ¼ in. x ½ mm. fraction being delivered to a conveyor where it is joined by the 1 in. x ¼ in. washed coal, in the manner already described. The water used for laundering, which now contains the ½ mm. x 0 fraction, passes to a 45 ft. dia. thickener for concentration. The clean water from the latter overflows into the clarified water sump for re-use in the washery circuit. The solids, which settle to the bottom of the tank, are fed towards the centre by means of a raking mechanism, and extracted by a positive head type diaphragm pump. The latter delivers the ½ mm. x 0 fraction, which is contained in approximately its own weight of water, to a bottom feed drum filter, 8 ft. dia. x 14 ft. long.

The drum speed is infinitely variable up to 2 r.p.m. and the drum is clad with a Monel metal cloth of 100 B.S. The filter reduces the moisture content of the ½ mm. x 0 coal to approximately 25 per cent, and the filter cake is then discharged onto a conveyor to join the ¼ in. x ½ mm. dewatered coal and the 1 in. x ¼ in. washed coal. The coal is remarkably free in filtering, and cakes as thick as 3 in. have been obtained, although 1 in. to 2 in. is more normal.

The medium used for obtaining a high density in the Chance cone is a mixture of silica-sand and water. The specification of the sand for use in the process is not rigid.

Settlement of the ½ mm. x 0 raw coal in the thickener tank is assisted by the addition of suitable reagents. The raw coal feed at Corrimal is reasonably free from clay, and it has been found that filter alum and sodium alluminate are suitable for flocculation and give a satisfactory clarified water.

MECHANICAL CUTTING AND LOADING IN COLLIERIES—IV

Scraper Box Ploughing and Slicer Loading

By J. M. CAW

The hardness of worked coals and width of seam naturally play a major role in determining the operating machines to be used in exploitation

SCRAPER box ploughing is suitable for very narrow seams having a floor of reasonable hardness and can be used in seams exceeding even 5 ft. in thickness provided the top coal falls well. Only relatively soft coal can be ploughed, or coal that is brittle or of medium hardness ; hard bands of pyritic material or a woody characteristic render it unsuitable.

During 1954 three installations produced 154,600 tons with a face O.M.S. of 4.47 tons. Seven projects were in progress of which 5 were on seams between 18 and 30 in. in thickness. In 1955 10 scraper box installations worked on seam faces from 2 ft. 6 in. to 4 ft. 9 in. in thickness and produced 217,000 tons.

A series of scraper boxes of heavy construction spaced at intervals and joined by dual 1 in. wire ropes are hauled to and fro along the face by a powerful winch sited usually in a roadway. The boxes are forced against the face by a heavy guide rail which is advanced by pneumatic or hydraulic jacks. Vertical cutting blades fitted with hard tips bear against the face and shear off thin slices of coal in both directions of travel. The boxes, although cross braced, are open at top and bottom and have a top-hinged door at one end so that the sheared coal is carried only in one direction. By arranging the box travel to exceed the spacing between boxes the coal is conveyed progressively from box to box to the delivery end of the face from where it is removed by a conveyor. No face conveyor is required. This system may prove very useful in gassy seams since all electrical machinery can be kept well away from the face.

The winch may be of up to 300 or more h.p. and has rope drums driven through planetary gearing so that the rope on one drum uncoils as the other takes in ; reversing the winch gives opposite rotation. Control is effected by brakes on the planetary gearing. The ropes are guided by pulley frames, which, in view of the heavy stresses involved, need to be of very robust construction and firmly located. The frames are moved forwards between shifts so that the pulley can be advanced quickly along them at intervals during the working shift.

The box ploughs are pulled at about 200 ft. per min. and the capacity of the system is equal to the capacity of the loader-gate box multiplied by the number of hauls per shift. On a well organized face 500 hauls a shift should be a possible attainment, and using a 1 ton box on a 3 ft. seam a gross output in

the region of 450 tons is possible. Rather than attempt to keep all the boxes cutting at once it has been found preferable to start at the loader-gate box and advance the face 3 to 4 ft. forming an inclined buttock which is gradually progressed to the top end of the face. The scraper boxes are used successively by advancing the guide rails by means of the appropriate cylinders connected at rail junctions. In this way work is concentrated over about 15 yards of face.

Box sizes vary between lengths of 6 ft. 6 in. and 11 ft., widths between 20 and 32 in., and heights between 10 and 22 in. Capacities commonly lie between ½ and 1 ton.

Collins [13] reports an output of 250 to 300 tons per shift and a face O.M.S. between 6 and 7 tons from a 3 ft. 6 in. seam in Plean colliery, Scottish division. The plough was installed because cutter picks striking the hard floor produced sparks constituting a fire hazard. The face was inclined at 11 deg. and 150 yards long. Water infusion rendered the coal easier to plough, the hard floor being equal to the bearing pressure of the boxes.

At Duffryn Rhonda colliery, in the South Western division, a 20 to 24 in. seam having a soft floor was ploughed. Steel rubbing strips 5 in. wide had to be welded at the base of the box sides to increase the bearing surface and prevent the boxes from sinking into the floor. At the Morrison Busty colliery in the Durham division a seam 20 to 24 in. thick was also worked under favourable conditions and a face O.M.S. of 5 tons averaged over about 3 years.[5]

The Huwood Slicer Loader may be classified as a plough. It is designed to work in seams exceeding 4 ft. 0 in. in thickness and will take a cut of up to 14 in. in both directions on each run along the face as it is pulled to and fro by an endless chain. The slicer has a line of pick blades at each end which are given a rotary movement of 340 r.p.m. by a 60 h.p. motor mounted to bridge the conveyor, between the main and adjustable goaf side frames. The picks cut a 1¾ in. wide groove at the back of the face and the wedgehead, which is set slightly behind them, pushes the coal sideways on to the conveyor. Floor coal is removed by bottom blades bolted to the base of the wedgehead.

Four vertical rollers support the machine on the conveyor and four horizontal rollers take side thrusts. The main dimensions of the slicer are : length 9 ft. 6 in., height 3 ft. 6 in., width 4 ft. 7 in. with a weight of 3½ tons. The speed of haulage along the face may be 12¾, 17¼ or 21¼ ft. per min. Either electric or compressed air motors may be used on the slicer. Jacks on the goaf side frame can be adjusted to tilt the machine towards or away from the face.

The machine operator travels along the goaf side of the face and has control of the cutting operation and remote control of the haulage units. Collins[5] reports the successful operation of an early model of the slicer on a 90 yard " end on " face in the Maudlin seam at Washington F colliery. The seam in the test area was woody in nature and somewhat " dead " due to working of seams above and below. The machine sheared up to a height of 4 ft. leaving some 2 ft. of top coal which proved very difficult to dislodge. Neither pneumatic picks, cardox or explosives proved entirely satisfactory for bringing down this top coal and it was therefore decided to transfer the machine to a 200 yard face in the Easington colliery, Durham division. Working on the 5 ft. 6 in. low main seam the performance over a six month period during 1955 was as follows :

	First 3 months	Second 3 months
Tonnage	28,543	34,245
Average face O.M.S. ..	4.61	5.15
Days worked	67	66
Average daily tonnage ..	426	521.4

Another project was in progress at the Dinnington Main colliery, North Eastern Division, during 1955. Work on a 200 yard face in the 4 ft. 8 in. to 5 ft. 0 in. thick Barnsley seam gave the following results over a 9 months period.

	First 3 months	Second 3 months	Third 3 months
Tonnage	22,916	26,184	14,331
Average face O.M.S.	6.34	7.42	8.13
Average district O.M.S.	4.55	5.34	5.74
Days worked	72	63	30
Average daily tonnage ..	318.3	415.6	478

Best weekly 6 day tonnage (1 shift slicing) 2,795 (9.16 O.M.S.)
Best weekly 5 day tonnage (1 shift slicing) 2,508 (8.5 O.M.S.)
Tonnage produced by the 2 Huwood slicers working during 1955 amounted to 229,800.

An advantage of the Huwood Slicer Loader is that shot firing is entirely eliminated. In connection with the generation of dust by plough cutters Collins quotes the following[5] :

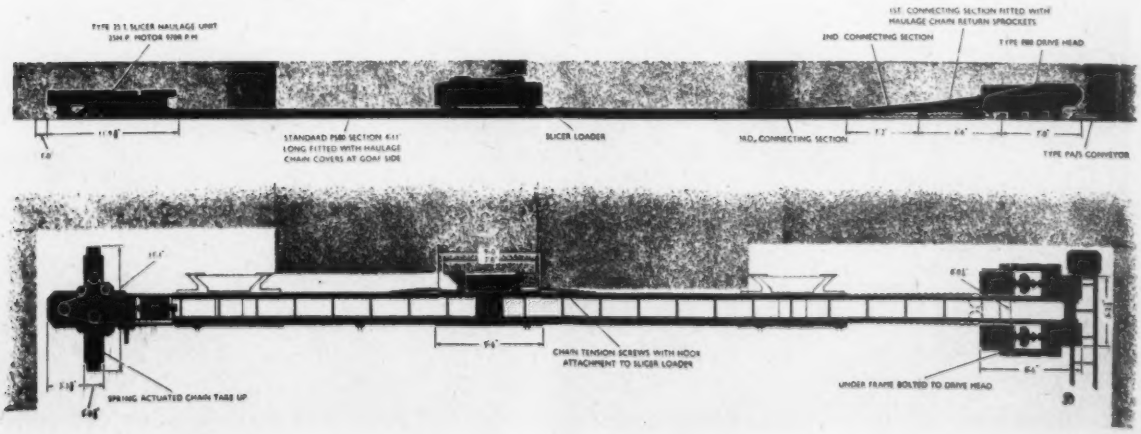
" It can reasonably be concluded from the results (of dust measurements) that plough mining produces only about ¼ of the airborne dust produced by pneumatic picks ; about ½ of that produced by normal longwall cutting, and probably about the same quantity as during a filling-shift of a normal mining cycle."

REFERENCES

[5] Collins, H. E. Coal Plough in the Durham Coalfield. Trans I.M.E. Vol. 112. Pt. 3. December 1952.

[13] Collins, H. E. Coal Ploughs in Great Britain. Centenary Congress of the Société de l'Industrie Minerale. June 1955.

Arrangement of slicer loader face


TYPE 20.1 SLICER HAULAGE UNIT
25H.P. MOTOR 970R.P.M.
1ST. CONNECTING SECTION FITTED WITH HAULAGE CHAIN RETURN SPROCKETS
2ND. CONNECTING SECTION
TYPE PSB DRIVE HEAD
STANDARD PSB SECTION 6'11" LONG FITTED WITH HAULAGE CHAIN COVERS AT GOAF SIDE
SLICER LOADER
NO. CONNECTING SECTION
TYPE PAN CONVEYOR
CHAIN TENSION SCREWS WITH HOOK ATTACHMENT TO SLICER LOADER
SPRING ACTUATED CHAIN TAKE UP
UNDER FRAME BOLTED TO DRIVE HEAD

Consolidated Zinc's First Half Century

IN 1905, the Broken Hill field of New South Wales depended for its existence on the solution of two major problems: the necessity for reasonably determining its ore resources, and a method of effecting the profitable large scale recovery of surfaced-dumped zinc residues and current mine output.

The Zinc Corporation was formed in the belief that the then known flotation processes would give commercial results, and that the acquisition and treatment of the zinciferous tailings from Broken Hill would produce worthwhile profits. By the end of 1910, it became clear that, within six years, the dumps would become exhausted. To acquire a producing mine had, therefore, become a compelling necessity for the Corporation.

After negotiations, half the capital of the Broken Hill South Blocks N.L. Co. was secured, and the company transformed into a limited liability company. The Zinc Corporation accelerated exploration and development, and speedily established that the southern areas possessed one of the greatest concentrations of mineralization on the Broken Hill field. A substantial interest was also acquired in Barrier South Ltd. (leases were later taken up adjoining the Barrier South property) and in 1936, The Zinc Corporation sponsored the formation of New Broken Hill Consolidated Ltd. to undertake the exploration, development and equipment of those areas for which purpose it subscribed approximately 30 per cent of the new company's capital.

In the first fifty years of its career, The Zinc Corporation and its offspring New Broken Hill Consolidated have produced more than 16,000,000 tons of ore, more than 20 per cent of the entire production of the Broken Hill field. The combined production of the two companies, including that of zinc concentrates recovered from purchased residues, represents over 3,862,000 tons of zinc concentrates containing 1,560,000 tons of recoverable zinc, and 3,103,000 tons of lead concentrates containing 2,192,000 tons of recoverable lead and 51,000,000 oz. silver.

The first commercial differential flotation process was discovered in 1912 by an employee of the Corporation. In 1913, a metallurgist working on the Broken Hill field discovered the use of copper sulphate for the activation of zinc blende. This development is now almost universally used in zinc flotation mills.

An attractively produced booklet has been published by The Zinc Corporation Ltd. to commemorate its fiftieth birthday, the Corporation having been registered in Melbourne, Australia, in September, 1905.

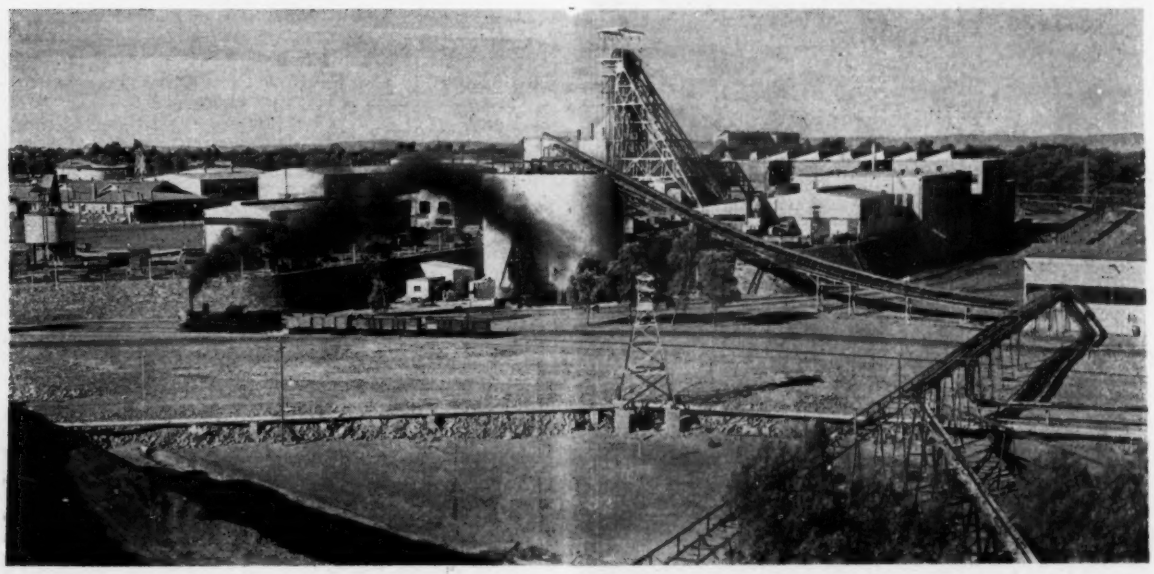
Following the success of the practices developed in The Zinc Corporation mill (in 1941 a lead concentrate assaying 78.0 per cent was produced), an all flotation circuit was decided upon for the treatment plant at N.B.H.C.

In the post-war period, New Broken Hill Consolidated has enjoyed a remarkable growth and production has risen from 41,723 tons in 1946 to 530,000 tons in 1955.

With the rapid expansion of interest which followed the end of the Second World War the Consolidated Zinc Corporation was formed in 1949 and now owns the whole of the issued capital of The Zinc Corporation and one-third of the capital of New Broken Hill Consolidated Ltd. The Consolidated Zinc Corporation's other interests include: the whole of the issued capital of Imperial Smelting Corporation Ltd., whose smelters at Avonmouth and Swansea treat a substantial part of the zinc concentrate output of The Zinc Corporation and New Broken Hill Consolidated Ltd., for the production of zinc metal, and half the issued capital of Broken Hill Associated Smelters, whose works at Port Pirie, South Australia, treat almost the whole of the lead concentrate output from the Broken Hill field for the production of refined lead and silver.

Another wholly owned subsidiary is Consolidated Zinc Proprietary which manages the Corporation's Australian interests.

The spacious layout of The Zinc Corporation's surface plant at Broken Hill, New South Wales



Machinery and Equipment

Mineral Research by Helicopter

The Bristol Sycamore helicopter is now being used in mineral survey operations to create an airborne electro-magnetic field which detects ore deposits.

The particular Sycamore engaged on mineral research is operating in Northern Ontario, Canada. The aircraft is equipped with a newly developed electro-magnetometer device in the form of a plastic "bird" over 20 ft. long, which is towed by cable from the underside of the fuselage. A transmitting coil is fixed to one end of the "bird" and a receiving coil to the other, while measuring and recording apparatus is carried in the aircraft.

By use of this equipment the helicopter creates around it a vast electro-magnetic field which, when the aircraft is flying 500 ft. above the ground, can penetrate over 300 ft. below the surface. Any conducting ore-body over which the aircraft passes results in the radiation of a secondary field, the phase and amplitude of which give an indication of the size of the ore deposit.

During a survey flight, the Sycamore is flown in a series of parallel lines over the area to be prospected. Preliminary reconnaissance at a wide line spacing is followed by more concentrated coverage over areas which prove promising. Finally, there is a detailed examination, if possible at lower airspeed, with very close line spacing and precise height holding.

One important advantage of using a helicopter for this purpose is that it can be flown over the area at very slow speeds, so permitting far more accurate definition of ore-bodies than is possible with fixed wing aircraft: another is that the helicopter can follow closely the contours of steeply sloping or undulating country.

DEVELOPMENTS IN SHAFT MUCKING

The Cryderman Shaft Mucker, described briefly in *The Mining Journal Annual Review* 1956 (page 115), is gaining increasing usage in the American mining industry.

Several U.S. contractors are now using the Cryderman shaft machine with such success that contracts, in specific instances, have been awarded on a basis of a guaranteed advance. Using standard procedures and hand mucking, a monthly advance of 150-180 ft. has been considered normal. Using the Cryderman machine, advances have been about double this rate.

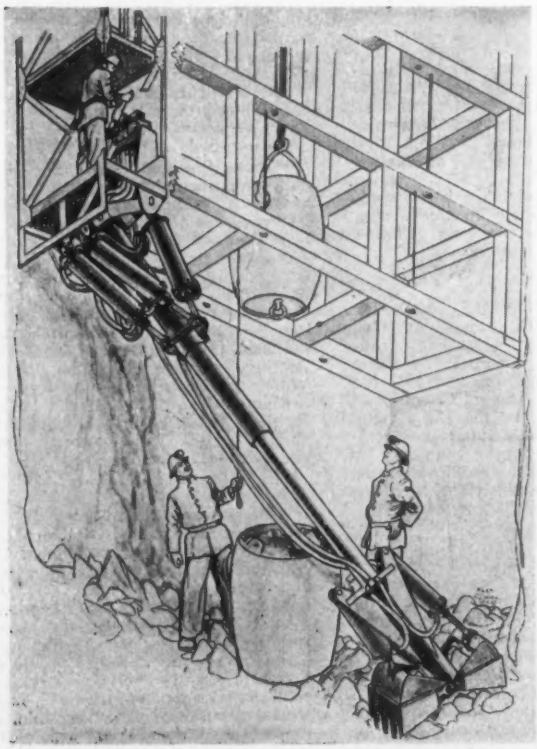
Many attempts have been made to simplify the mucking sequence. One of the most widely accepted practices adopted by most operators has been the change from the cut and square method to benching. The former method leaves an almost level muck pile and hand shovelling must be done straight down through the broken rock. Benching presents an advantage in that it leaves the broken rock from each blast piled up against one end of the shaft. But it still requires that all muck must be handled by shovel. With the Cryderman, it does not matter which method is used.

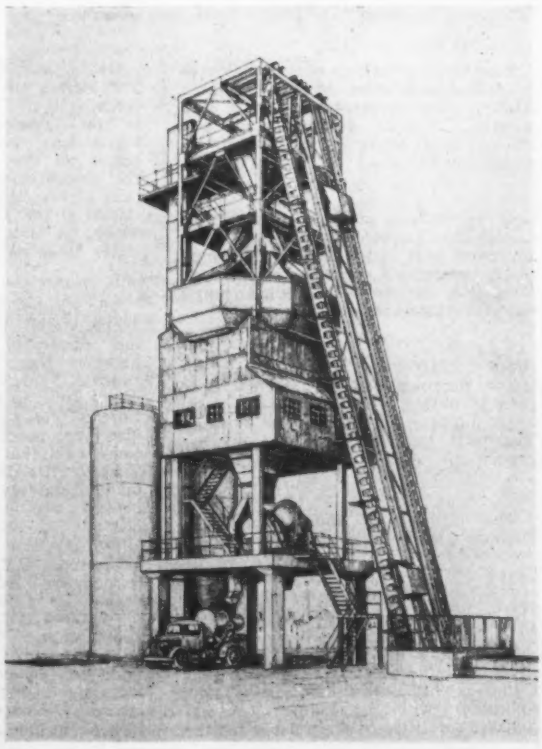
A NOVEL SKIP HOIST

A skip hoist with a novel application will soon be erected by Humphreys and Glasgow Ltd. The installation will hoist sand and gravel to the top of a ready-mixed batching plant for the Ham River Grit Co. Ltd.

A skip hoist was selected for this installation in view of the great saving in space it offers compared with the more conventional use of conveyors for elevating sand and gravel. This installation will comprise a Humphreys-Glasgow fully automatic single-speed twin skip hoist with a capacity of 72 tons an hour of sand or gravel.

Artists' impressions of two equipments described on this page. At left is shown the Cryderman Shaft Mucker, and at right the skip hoist to be erected by Humphreys and Glasgow Ltd.





MINING MISCELLANY

It is reported that the exploitation of the coal mines at Eregli and Azdavay is to be transferred from Etibank to a private company.

★

The first Government Metal testing facilities for prospectors in the Central African Federation have now been provided by the Geological Survey Department in Salisbury.

★

Dominion Steel and Coal Corporation Ltd. Overseas Sales Engineering Service has been formed into a new company registered as Dosco Overseas Engineering Ltd.

★

So far, 98 per cent of the contracts awarded for mechanical and electrical equipment for the Zambesi hydro-electric project at Kariba have been placed with British manufacturers.

★

In order to maintain the level of production in the Limburg coal mines, which is threatened by labour shortage, recruiting campaigns are being organised for coal workers in Austria as well as in Italy.

★

Considerable deposits of high-quality sillimanite shales have been discovered in Burgutui mountain range, U.S.S.R. Sillimanite is used for refractory and acid-resisting materials and in the production of aluminium and various light alloys. Hitherto it has been found only in India.

★

Reserves of very high quality coal have been discovered near Antalya, Southern Turkey. The discovery has come as a surprise, even to experts, as it was thought that Turkey's coal beds were mainly on the Black Sea coast.

★

G. G. Deakin, marketing manager of Caterpillar Tractor Co. Ltd., Desford, Leicester, is visiting Caterpillar's United States operations for three months to familiarize himself with the company's marketing operations.

★

Some 930,000 tons of iron ore concentrates were shipped in the first nine months of this year from the Sydvaranger mines in Kirkenes, North Norway. The total shipments for the year are expected to be well over 1,000,000 tons.

★

The geology of the Miller Lake Portion of the Gowganda Silver Area is described by E. S. Moore in a publication issued by the Ontario Department of mines as its 64th annual report.

★

Mr. Vaughan Pendred, managing director of the Head Wrightson Export Company Ltd., is visiting Calcutta in connection with the company's recent contract for three blast furnaces for the Government of India to be constructed at Durgapur, West Bengal.

★

Several firms (whose names have not been revealed) are to investigate deposits of iron and copper in the Zaragoza district of Spain. Over 20,000 hectares in the north of the province are to be prospected for copper deposits and 2,500 hectares in the Moncayo hills for iron.

★

Successful laboratory tests by the U.S. Bureau of Mines, which may lead to development of an economical method for recovering both mercury and antimony from ores of the Kuskokwim River area in Alaska, are described in a report issued by the Department of the Interior.

★

A grant of £19,000 has been made by the Anglo American Group for the establishment of the first industrial research project in the physics department of the University of the Witwatersrand. A grant of £5,000 a year has been made to investigate some problems of rock drilling.

★

New deposits of copper ore have been discovered at Jermanice-Zdroj, near Zlotoryja (Lower Silesia). It is thougnt that they probably extend as far as Iwiny (Wroclaw voivodship), where the Konrad mine, Poland's biggest copper ore producer, is in operation. Prospecting and drilling are in progress at Jermanice.

★

Geological prospecting by the Shallow Coal Mines Construction Enterprise led recently to the discovery of brown coal in the Zawiercie district (Katowice voivodship) of Poland. Work has begun on the construction of shallow coal mines in this area. At Ciagowice, near Zawiercie, production has already started at the Zawiercie open-cast mine, which is the first of six shallow mines being built in this area.

★

The leader of the U.S. delegation which visited Turkey recently to study the possibility of expanding trade between the two countries (*Mining Journal*, 5/10/56, pp. 390 and 391) has sent a letter to the Istanbul Chamber of Commerce, stating that the U.S. Chambers were prepared to initiate co-operation with their opposite numbers in Turkey. It added that a study was being made of the ways in which Turkish mines could be exploited with American help.

★

Crescent Rutile N.L., a company formed in Adelaide, is raising its capital to £250,000 by the issue of 1,995,000 (A) 2s. 6d. shares to the public at par. Treatment plants will be built at three of the company's areas; at Wide Bay (Queensland), Hat Head and Kilcare (N.S.W.). These three areas are estimated to contain 49,000 tons of rutile. Further areas are being tested at McMasters, Avoca, Tuggerah and Kempsey, while negotiations are proceeding for others again.

★

The American Link-Belt Company has recently developed and built a monster roller bearing capable of sustaining a load of over 300,000 lb. The huge roller bearing, with a shaft diameter of 11 in., will be used on a mining conveyor where it will be subjected to extremely heavy loads. These self-aligning roller bearings are enclosed in cast steel housings.

★

The Anglo American group of companies and the Rhodesian Selection Trust have jointly given £4,000 towards the establishment of the all-African Nyatsime College near Salisbury, Southern Rhodesia. The organizing secretary of the committee working for the establishment of the college, Mr. Stanlake Samkange, described the gift as "a great act of faith" on the part of the two companies. The college will provide commercial and industrial training as well as secondary education. More than 500 acres in the Chiota Reserve have been set aside for it.

★

Colonial Geology and Mineral Resources, Vol. 6, No. 2 contains an article on Nigerian diatomite, by Drs. E. R. Varley, J. W. du Preez, E. Parkin, and Mrs. Enid I. C. Scott. Large deposits of diatomaceous earth have been reported from time to time in the Bornu Province of Nigeria, but have not been worked to any appreciable extent because of their remoteness from industrial centres. In recent years, however, they have attracted increasing attention in view of the possibility of the material being used for controlling groundnut insect pests.

★

Hobart Brothers Co. has developed and produced a giant dredge for the mining of titaniferous sand in Florida, states a report from Troy, Ohio. The new dredge, a bucket-type similar to those used in gold-mining, will handle enough sand to produce 200 tons of titanium a week. The suction-type dredge now in use can handle only half that amount. One ton of rutile requires the dredging of 100 tons of sand. Hobart Brothers has been working sands at Winter Beach, Florida, for four years, dredging them to a depth of 30ft. Rutile is separated by a sluicing method and two saleable by-products—ilmenite and rutile—are recovered.

★

A three-man mission from the World Bank, due in Accra on November 3, has sent the Gold Coast Government a long questionnaire on the country's present and future economic plans. The mission is to study the Gold Coast's economy as a first step in probing the country's suitability for a loan to finance the Volta River scheme, which would make the Gold Coast an important aluminium producer. Commander R. E. G. Jackson, special commissioner for the Volta River Preparatory Commission, which drafted

the report on the Volta scheme, has returned to the Gold Coast from the U.S. and will help the Government to answer the questionnaire.

★

The National Coal Board, which recently set up a Reconstruction Department at National Headquarters to be responsible for its capital investment programme, announces that a Reconstruction Department is being established on November 1, 1956, in its Scottish Division, which will bear a particularly heavy share of this programme. The Divisional Reconstruction Director is to be Mr. H. R. King, the present Production Director. He will be succeeded by Mr. R. A. Moore, the present Deputy Production Director, who will be appointed Production Director (Operations).

★

Cia Mercantil Industrial Inga, makers of galvanized tubes, have installed pilot plant to perfect a new method of processing calamine ores to produce metallic zinc, reports our Correspondent in Brazil. This ore, of which Brazil has a plentiful reserve, contains 45 per cent Zn and the company will require 2,000 kWs. for an initial output of 200 tons monthly, to be raised later to 1,500. This, they claim, will effect an annual saving on imports of U.S. $20,000,000. Unlike the Waelz process which produces ZnO_2 from calamine ores, subsequently transforming it to metallic zinc, Inga's method does not require high temperatures, avoids the risk of synthesis in the furnace and appears to have overcome the difficulty caused by the 25 per cent of silicate contained in the ores.

★

Fifty French architects and 15 delegates from Aluminium Francais are touring New York, Pittsburgh, Chicago, Detroit, St. Louis and Boston. The purpose of the trip is to view the vast strides that have been taken by American architects and to study the progress made in the use of aluminium and other light alloys.

★

On October 22 a party of Russian trade union delegates who had been staying at Wortley Hall, Sheffield—home of Labour's Eductional Recreational Holidays—visited J. and H. McLaren, Ltd., diesel engineers of Leeds. During the visit they were given an opportunity to see British industrial relations at work and to talk with executives, trade union representatives, and men on the shop floor. They were greatly impressed by the efficiency of the operators and their high degree of skill.

PERSONAL

Mr. Harold C. Cowen has been appointed director and chairman of the Rosterman Gold Mines Ltd. and Messrs. Michael E. Ormrod, James E. Garland and Godfrey A. Anderson have also been appointed directors. Captain A. H. Moreing has resigned his position as chairman and director of the company and Messrs. E. C. Baillie, D. L. Dowie and H. C. L. Williams have resigned from the board.

★

Mr. Alexander A. McLeod has been appointed a director of North Kalgurli (1912).

★

Mr. J. C. Emison has been elected a director of Fresnillo Company.

Mr. D. R. Frost has been appointed a director of British Ropes.

★

Mr. I. T. Greig has been appointed to the boards of East Geduld Mines and Marievale Consolidated Mines.

★

Mr. E. J. Read has joined the Boards of Grootvlei Proprietary Mines, Van Dyk Consolidated Mines, and Winkelhaak Mines.

★

Mr. E. M. T. Matthews has been appointed to the boards of Geduld Proprietary Mines and St. Helena Gold Mines.

★

Mr. A. G. Stewart, chairman and general managing director of Stewarts and Lloyd's, Ltd., has been appointed a part-time member of the Iron and Steel Board. He replaced Sir Andrew McCance, who at the end of his period of office on May 31, 1956, did not seek re-appointment.

★

Mr. Jack Spalding, mining consultant to the governments of Tanganyika and Uganda, is being flown to England for an abdominal operation. It is hoped that he will return to Dar es Salaam by the middle of December.

★

Mr. G. E. Godfrey has resigned his position with the Dunlop Rubber Co. Ltd. to join the board of the Silvertown Rubber Co. Ltd.

★

The October, 1956, issue of *Scientific Film Review* contains details of 145 films on atomic energy and related subjects. This is the first comprehensive list of its kind.

★

A third edition of the *Tinplate Handbook* has been published by the Tin Research Institute, Fraser Road, Perivale, Greenford, Middlesex. The publication has been revised and enlarged and gives figures for tinplate production up to the end of 1955. It is available free of charge to all interested in the manufacture, buying and use of tinplate.

★

Mr. Harold Humphries and Mr. W. Jenkins Gibson, deputy chairman and deputy managing director, respectively, of Millspaugh Ltd., have left for Canada and the U.S. to join the managing director of Millspaugh Ltd., Mr. R. C. Heys, in connection with the further development of their Canadian companies in the pulp and paper industry. Mr. Humphries will also have important discussions in New York affecting the Hadfields group of companies. These discussions will aim at further extending sales of these companies' products in the U.S.

★

Mr. W. L. Beckett, formerly London area sales manager of the National Gas and Oil Engine Co. Ltd., has been appointed London manager of the company and a director of its subsidiary, National Oil Engines (Export) Ltd. In both positions he succeeds Mr. F. D. Langley, who has retired after 34 years' service with the parent company. Mr. Langley will continue to be available to both companies in a consultative capacity.

★

Plastic pipes are mainly produced by what is known as the extrusion process. In order to bring together existing information and to discuss the almost unlimited new fields of application, a symposium on "Extruded Rubbers and Plastics" was held at the National College of Rubber Technology, Holloway Road, London, on October 30 and 31.

★

A new and enlarged London Flexibles Centre operated by the Flexibles Advisory Service of the Compoflex Co., Ltd., was officially opened on Thursday, October 25, at 23-25 Northumberland Avenue, London, W.C.2, by Sir Norman Kipping, director-general of the Federation of British Industries. During the opening ceremony Sir Norman announced publication of the first issue of *Arteries of Industry*, a quarterly journal which the company is introducing as part of its advisory service. The new journal is to be distributed each quarter to users and potential users of flexible tubes and hoses. It will contain technical and general interest articles written by outside contributors on the importance of flexibles to their own particular industries. The company claims to be the only manufacturers making metallic, rubber, plastics and composite hoses. Its advisory service can thus deal with all problems connected with flexibles.

CONTRACTS AND TENDERS

Burma

TEN./22235: "Beco" crusher type L.48 for ores and other materials, with one pair of discs for coarse grinding and one pair for fine grinding, suitable for all sorts of materials except very hard and tough ore, with electric motor 0.6 kW. for single phase current, 220 volts. Issuing authority, The Director General, Union of Burma Purchase Board, St. John's Road, Rangoon. Tender No. IVA/1123/P. and M. of 55-56. Closing date 12/11/56. Local representation is not essential. B.O.T. Ref.: E.S.B./26971/56. Telephone enquiries to Chancery 4411, extension 738 or 771.

★

India has placed an order valued at 30,000,000 marks with German firms for excavation and conveyor machinery for the lignite industry. The firms are Krupps of Essen, who received orders for conveyor machinery worth one third of the total, and the Lubeck Machine Works, who were accorded the balance of the contract. The machinery is to be used at the Neyveli deposits, in Madras State, where there are reserves of lignite estimated at 2,000,000,000 tons.

AGENCIES WANTED

Panama Machinery and Equipment Inc., 2715 6th Avenue, S., Seattle, Washington, wish to represent, on a sole agency basis, U.K. manufacturers of machinery and handling equipment such as air compressors from 10 c.f.m. to 125 c.f.m. (both stationary and portable types), power tools (air or electric), impact wrenches, electric drills, overhead hoists, fork lift trucks, machine shop tools, etc. Quotations should show c.i.f. Seattle prices in U.S. dollars. Manufacturers interested should write by air mail direct to Mr. Merl Sidell, of the U.S. firm and are asked to copy their initial correspondence to the British Consulate-General, 1814 Exchange Building, Seattle 4, Washington. B.O.T. Ref.: E.S.B./8136/56. Telephone enquiries to Chancery 4411, extension 776.

Metals and Minerals

Tungsten's Sound Long-Term Prospects

Since the beginning of the year the general trend of wolfram prices has been persistently downwards, the current range of 220s. to 225s. per l.ton unit, c.i.f. Europe, being some 50s. lower than the quotations ruling on January 6. In some quarters it is thought that the floor level will prove to be in the region of 220s., below which the price would cease to be economic for producers in some areas. Meanwhile buyers are postponing purchases pending more settled conditions.

In these rather depressing market conditions the robust confidence of Mr. F. Gates, chairman of Beralt Tin and Wolfram Ltd., comes as welcome tonic. Last year Mr. Gates reminded the company's shareholders of the "mercurial possibilities" of wolfram, while at the same time expressing confidence in the immediate outlook. At the annual meeting last week he was able to claim that until recently this confidence had been justified by the strength and relative stability of the market.

There is no doubt that supply and demand are at present in delicate equipoise, due to the substantial rise in world production which has been artificially stimulated by Governmental action since 1950. As the chairman pointed out, however, it has to be borne in mind in this connection that the U.S. Government has been taking a large tonnage off the market for some years past at special high prices for stockpiling purposes, particularly from its own domestic producers, whose output last year was greatly in excess of American consumption. It is, therefore, even more difficult than usual to forecast what the price trend in this volatile commodity is likely to be in the immediate future.

Mr. Gates expressed his personal belief that over the years the demand for tungsten would increase, due to the development of new techniques and the expanding requirements of the steel industry all over the world. This confidence in the long-term future is shared by producers in the U.S., who foresee an an expanding demand for tungsten not only from the steel industry but also as a constituent of high temperature alloys for supersonic flight.

So far as short-term prospects are concerned, the possibility of some further temporary price recession cannot be entirely disregarded, although the present situation in the Middle East, if at all prolonged, might well cause the pendulum to swing quite rapidly in the reverse direction. Whatever the immediate future may have in store, Beralt itself is in a strong competitive position as a large, efficient and low-cost producer of concentrates which have a world-wide reputation.

U.S. STOCKPILE SITUATION

In a semi-annual review of the U.S. stockpile situation, the Office of Defence Mobilization reports that minimum objectives have been met for 44 materials, the latest being beryl, bismuth, platinum and iridium. The list of filled long-term objectives has been increased to 11 materials by the addition of manganese, battery grade, natural ore; mercury, iridium and platinum. During the last six months 26 stockpile reviews of major materials were completed to adjust the stockpile, as necessary, to changing defence or industrial needs. Nine materials have been accorded lower objectives; five have higher objectives; palladium was added to the list of strategic and critical materials for stockpiling. At present, approximately 20 additional reviews are under way.

PROTECTION FOR U.K. ANTIMONY

For some time past, certain tonnages of Chinese and Russian antimony metal have been available in Britain at prices considerably below those quoted for domestically produced metal, despite a 10 per cent import duty on foreign metal entering this country. For instance, some Chinese 99½ per cent metal recently sold at £180 per ton delivered, import duty included. For the past three years English 99.6 per cent antimony has been quoted at £222 10s. per ton delivered and 99 per cent at £210 per ton. The extent to which sales of imported material have affected domestic producers is indicated by the application for increased protective duty, which, as we reported last week, is currently under consideration by the Board of Trade. In the event of the import duty being raised, a figure of up to 33⅓ per cent has been mooted.

SILVER OVER 80d.

The price of silver on Thursday at 81¼d. for spot and 80⅞d. forward reached a peak not equalled for more than 35 years and the quotation is advancing towards the all-time high of 89¼d. reached in February, 1920.

While the strength of the market is being attributed to seasonal increases in demand to meet essential industrial needs this is only a very small part of the story. In the first place Mexico, the world's largest producer, has not been able to exercise her traditional rôle of stabilizing prices since March, 1955, when export commitments, plus internal coinage requirements, made it necessary for the Bank of Mexico to leave the market to its own devices. Thus over the last year and a half Mexico has been husbanding its silver which has cut off the London and New York market from their usual sources of supply. Moreover, lend-lease silver, totalling 381,300,000 oz. at the beginning of this year, is due for repayment by April, 1957. The Netherlands, the United Kingdom and Australia have been shipping silver to the U.S. this year against their respective debts. Although some 127,000,000 oz. of the total debt does not have to be repayed until April, 1959, the repayments in progress and in prospect have contributed to the shortage of available metal, unrelieved this year by any offerings from Russia.

World silver consumption has consistently been in excess of world silver production and with the off-take for the Arts and Industries steadily increasing any rise in demand for coinage requirements would lead to a severe squeeze on available supplies which could only be satisfied from the U.S. Treasury stocks.

U-235 COMMERCIALLY MADE

The world's first production by private industry of enriched uranium for use in generating commercial electrical power from atomic energy has started at the new Mallinckrodt Chemical Works' plant, Hematite, Mo. Uranium enriched in the isotope U-235 is being manufactured to individual customer specifications and is shipped to customers' plants for fabrication into shapes that will be most useful in centre or core of atomic reactors. Two grades of uranium dioxide are being produced. Other compounds, such as uranium trioxide, can be manufactured should the demand arise.

Eldorado Mining, the Canadian Government's uranium buying agency, has announced extensions of time for some uranium companies. Producers unable to obtain full write-off of preproduction and capital expenses by March 31, 1962, will have their special price contracts extended one year and the quantities increased. The new arrangement also provides for a possible change in price on quantities delivered after March 31, 1962.

FRENCH NICKEL PRICE

It is reported from Paris that Le Nickel, the New Caledonian Mining company which meets the bulk of French requirements, has applied for authority to boost its selling price. Since April, 1956, this price has been 870 francs per kilo. The shortage of nickel has been so acute in France that consumers have been seeking marginal supplies on foreign markets, notably Japan, and at very much higher prices. Nickel consumption by the armed forces has, in particular, threatened deliveries to the motor industry. The search for nickel substitutes and for new processes to recover nickel from special steel scrap has been intensified. Manganese, molybdenum and chromium are being put to more extensive use and a method has been developed for extracting nickel from nickel-bearing steel scrap. Nickel-coated steel instead of nickel-bearing steel is being used in the manufacture of plates for the oil industry, while French steel producers are working closely with their clients to develop more rational nickel uses.

The South African Government is contemplating the introduction of a rationing system for nickel in 1957. A circular has been sent to consumers by

the Department of Commerce and Industries and a final decision was expected by the end of October. Nickel is distributed in the Union by I.C.I., who themselves receive allocations from Mond Nickel.

According to a dispatch from Vancouver, a major nickel ore deposit may have been found in the Nahlin River area of Northern British Columbia, 100 miles North-East of Juneau, Alaska. The nickel mineral is a form of millerite and occurs in a green zone varying in width from 200 to 600 ft. The break has been traced for some 37 miles. Millerite is easy to treat and makes a high-grade concentrate.

RECORD BERYLLIUM PRODUCTION

World production of beryllium ore reached the record total of 8,700 s.tons in 1955 according to the Bureau of Mines, U.S. Department of the Interior. In 1955 it amounted to 7,200 tons. For the second year since 1953, when the record total of 751 tons was achieved, U.S. domestic production of beryl dropped—this time to 500 tons. Imports totalled 6,307 tons and these added to domestic production amounted to 75 per cent of the estimated world output. Africa produced 3,352 tons of beryllium last year and South America 3,308 tons. Of the balance 440 tons came from Europe, 851 from Asia and 230 from Australia.

MORE LITHIUM CONCENTRATES

Quebec Lithium Corporation, Canada's first producer of lithium concentrates, has stepped up its milling capacity to 1,000 tons a day. It is understood the company is now meeting requirements under its five-year contract with Lithium Corporation of America, calling for delivery of 165 tons daily of spodumene (lithium oxide) concentrates at a price of $11 per unit of lithia. The company anticipates production of 400 tons of feldspar concentrate per day as a by-product of the expanded operation. Some thought is being given to production of lithium sulphate from concentrates in excess of the amount taken by Lithium Corporation.

PLATINUM MARKET QUIET

The extreme tightness for platinum noted earlier in the year no longer prevails in New York, but leading refiners continue to allocate metal to established users. Offerings from dealers last week were generally restricted to comparatively small lots. Stabilization of quotations at around their present level of $103-105 and seasonally reduced buying on the part of the larger consumers are responsible for the relative quietness of the market.

Platinum seems to be devoid of interest at the moment, so far as the U.K. is concerned, and in London featureless conditions prevail in the free market. Some business has been done, but it is said to be very small. However, supplies available are believed to be none too plentiful, so that sellers are not pressing and the price range remains unchanged. Russian platinum is still being offered at competitive prices, but at the present level of demand buyers are not anxious to acquire supplies.

COPPER · TIN · LEAD · ZINC

BRAKE ON U.S. COPPER OUTPUT

As was to be expected, the 4c. price cut initiated by Phelps Dodge on Wednesday of last week has since been followed by the other U.S. domestic producers. Simultaneously with the price cuts have come announcements of cut-backs in domestic production by Phelps Dodge and Anaconda through a reduction in overtime working, equivalent to two days per month. Kennecott, the largest U.S. producer, has so far made no move, although Mr. C. R. Cox, president of Kennecott, was reported last week as saying that "our rate of future operations will be geared to demand, which presently is showing some improvement". Kennecott is in the position as having no overtime to eliminate, as its properties work a seven-day week with a staggered labour force.

At the beginning of 1954—the last time that copper production showed signs of running ahead of immediate requirements—American producers appeared determined to prevent the domestic price from going below 30 c. To achieve this they cut back production sharply in the States (and to a much lesser extent in Chile). The fact that, in so doing, they badly underestimated the strength of the European market, is of no relevance to the present situation except as a warning against precipitate action. That lesson has doubtless been well learned, and we may expect to see the brake applied more gradually this time. The Phelps Dodge and Anaconda cut-backs announced last week are together estimated to equal about 4,000 tons of copper a month or slightly less than 5 per cent of total U.S. domestic mine output.

Incidentally, we have yet to discover the level at which U.S. producers will this time be determined to hold prices. It is not just a matter of domestic production costs. Were this so the majority of American producers could, even to-day, probably afford to see the price below 30 c. The real problem is the price below which the Chilean government will shut down on exports, as they have done on previous occasions—notably towards the end of 1953. Recent experience suggests that the Chilean government is likely to be much more sensitive to any further fall in the copper price than is the U.S. producer. However, even if Chile were now to suspend, or cut down on forward sales, this could hardly have any effect on the immediate supply position as the Minister of Mines was himself reported last week as saying that the whole of Chile's production for 1956 had already been sold ahead, due principally to the marketing of copper in Europe.

Meanwhile, the immediate effect on the London market of the U.S. cut-back announcements was for copper to harden by about £10 on Friday, while this week's war news from the Middle East has now hoisted it very considerably further to around £300 per ton (37½ c. per lb.). The U.S. custom smelters, which at the beginning of this week were reported to be offering as low as 34½ c., have also reacted and yesterday were offering at 36 c. to the home market.

MIDDLE EAST NEWS HITS TIN

During the past week the London spot tin price has risen by some £70 to around £875 with the backwardation widening to some £40, while the New York quotation has moved up from 107 c. to 112½ c. nominal. The immediate cause of this has been the Israel-Egypt flare-up and its consequences but coming on top of the Singapore riots and the earlier anxieties about the Canal, it has caused the market, which was already short of prompt metal, to react sharply. The tight position in London is in part the result of steady buying from the States, where metal is also short, and at the end of last week metal in L.M.E. warehouses was down to 545 tons. There is still another three months or so to go before the effects of the prospective closing down of the Texas smelter can make themselves felt in the market and until then any interruption to the normal flow of supply may well find the market in difficulty.

LEAD/ZINC FIRMER IN LONDON

On the London market the prices of both lead and zinc have reacted to the international situation although, of course, less sharply than in the case of copper or tin. Lead has gone up about £3 and zinc about £4 per ton. In the States there has been no change in the domestic quotations, although demand for both metals has been active.

Last week the G.S.A. issued the usual monthly invitation for tenders for newly-mined domestic lead and zinc. In the case of zinc, the trade again expects that a substantial tonnage of zinc will be offered. Lead sales, on the other hand, have been looking rather better and for the week ended on October 24 were reported at around 10,500 s.tons against 9,000 in the preceding week.

The London Metal Market

(From Our L.M.E. Correspondent)

Last week it was announced that some of the copper producers in America were to cut production by some 10-16 per cent by doing away with week-end overtime which was introduced during the period of scarcity. This caused a mild rally which did not look like being sustained when it was realised how little the cut would amount to. However, the critical news from the Middle East has resulted in keen buying in the London market and prices rose rapidly to over £300 per ton at one time. It is understood that one of the leading custom smelters in America has advanced its price by 1 c. to 36 c. per lb.

Tin in official warehouses declined further last week. The possibility of delays in shipments from the East owing to the flare-up in the Middle East and the trouble in Singapore, together with the tight technical position in this market, had the effect of not only causing a sharp rise in price but also an increase in the backwardation to the region of £40 per ton. On Thursday morning the Eastern price was equivalent to £852½ per ton c.i.f. Europe.

There has been no special feature in the lead and zinc markets, but these have been under the influence of the Middle East situation although to a rather lesser degree than copper and tin.

Closing prices and turnovers are given in the table overleaf.

LONDON METAL AND ORE PRICES, NOVEMBER 1, 1956

THE WEEK ON THE L.M.E.

	October 25		November 1	
	Buyers	*Sellers*	*Buyers*	*Sellers*
Copper				
Cash	£262½	£263	£296	£296½
Three months	£263	£263½	£296½	£297
Settlement	£263		£296½	
Week's turnover	10,300 tons		8,825 tons	
Lead				
Current ½ month	£114½	£115	£117½	£117½
Three months	£113½	£113½	£116½	£117
Week's turnover	2,375 tons		4,650 tons	
Tin				
Cash	£807	£809	£875	£876
Three months	£787½	£788	£832½	£835
Settlement	£809		£876	
Week's turnover	575 tons		845 tons	
Zinc				
Current ½ month	£96	£96½	£99½	£99½
Three months	£93½	£94	£96½	£96½
Week's turnover	2,725 tons		4,450 tons	

METAL PRICES

Aluminium, 99.5%, £198 10s. per ton

Antimony—
English (99%) delivered, 10 cwt. and over £210 per ton
Crude (70%) £200 per ton
Ore (60%) bases 23s. 6d./24s. 6d. nom. per unit, c.i.f.

Arsenic, £400 per ton

Bismuth (min. 1 ton lots) 16s. lb. nom.

Cadmium 12s. 0d. lb.

Cerium (99% nett), £13 18s. lb. delivered U.K.

Chromium, 7s. 1d. lb.

Cobalt, 21s. lb.

Copper, £296 10s. per ton

ORES AND OXIDES

Bismuth .. .. 65% 8s. 6d. lb. c.i.f.
40% 6s. 3d. lb. c.i.f.

Chrome Ore—
Rhodesian Metallurgical (semifriable) 48% .. .. £16 15s. 0d. per ton c.i.f.
,, Hard Lumpy (45%) .. .. £16 15s. 0d. per ton c.i.f.
,, Refractory 40% .. .. £10 15s. 0d. per ton c.i.f.
,, Smalls 42% .. .. £13 15s. 0d. per ton c.i.f.
Baluchistan .. .. £17 5s. 0d. per ton c.i.f.
Columbite, 65% combined oxides, high grade .. .. 190s./205s. per unit

Lithium Ore —
Petalite min. 3½% Li_2O .. .. £8-£10 per ton f.o.b. Beira
Lepidolite min. 3½% Li_2O .. .. £8-£10 per ton f.o.b. Beira
Amblygonite basis 7% Li_2O .. .. £35-£40 per ton f.o.b. Beira
Magnesite, ground calcined .. .. £28 0s./£30 0s. d/d
Magnesite Raw (ground) .. .. £21 0s./£22 0s. d/d
Molybdenite (85% basis) .. .. 8s. 5d. nom. per lb. (f.o.b.)

Titanium Ore —
Rutile 95/97% TiO_2 .. .. £95-£105 per ton c.i.f. Aust'n
Ilmenite 52/54% TiO_2 .. .. £8½-£9½ per ton c.i.f. Malayan
Wolfram and Scheelite (65%) .. .. 220s./225s. per unit c.i.f.

Manganese Ore Indian
Europe (46%-48%) basis 125s. freight .. .. 137d. nom. per unit c.i.f.
Manganese Ore (43%-45%) .. .. 115d. nom. per unit c.i.f.
Manganese Ore (38%-40%) .. .. 110d. nom. per unit. (including duty)

Vanadium —
Fused oxide 90-95% V_2O_5 .. .. £12½-£13½ per unit c.i.f.
Zircon Sand (66-67% ZrO_2) .. .. £18-£19½ per ton c.i.f.
Zirconium Oxide — Calcined Opacifier .. .. £325 1-ton, delivered

Germanium, 99.99%, Ge.kilo lots 3s. 4d. per gram
Gold, 252s. 0d.
Iridium, £29/31 oz.
Lanthanum (98/99%) 15s. per gram
Lead, £117 15s. per ton
Manganese Metal (96% - 98%) £259/£265 according to quantity
Magnesium, 2s. 4d. lb.
Nickel, 99.5% (home trade) £519 per ton
Osmium, £24/27 oz. nom.
Osmiridium, nom.

Palladium, £8 0s./£8 10s. oz.
Platinum U.K. and Empire Refined £34/£35 oz.
Imported £37 15s. nom.
Quicksilver, £83 10s. - £84 10s., ex-warehouse.
Rhodium, £42. oz.
Ruthenium, £15/£17 oz.
Selenium, 112s. nom. per lb.
Silver, 81½d. f.oz. spot and 80¾d'd.
Tellurium, 15s./16s. lb.
Tin, £876 per ton
Zinc, £99 15s. per ton

LONDON STOCK EXCHANGE PRICES, OCTOBER 31, 1956

Finance	Price Oct. 31	+ or — on week
African & European	59/4½	—1/10½
Anglo American Corpn.	138/9	—3/9
Anglo-French	21/9	—9d
Anglo-Transvaal Consol.	26/10½	.....
Central Mining (£1 shrs.)	55/6	—3/3
Consolidated G'fields	57/9	—2/6
Consol. Mines Selection	33/9	—1/3
East Rand Consols	1/7½	—1½d
General Mining	73/9	—2/6
H. E. Prop.	8/4½	+1½d
Johnnies	41/-	—6d
Rand Mines	66/3	—7½d
Rand Selection	35/-	—1/3
Union Corporation	35/9XD	—3/6
Vereeniging Estates	100/-	—1/10½
Writs	32/6	—1/3
West Wits	33/9	—1/3
Rand Gold		
Blyvoors	21/9	—6d
Brakpan	5/9	—1½d
Buffelsfontein	27/1½	—1/-
City Deep	11/-	.....
Consol. Main Reef	14/10½	+3d
Crown	31/3	—1/4½
Daggas	37/6	.....
Dominion Reefs	16/10½	—1/1½
Doornfontein	20/1½	—10½d
Durban Deep	25/7½	—4½d
E. Champs	3/3	+3d
E. Daggas	8/3	.....
E. Geduld (4s. units)	28/6	—6d
E. Rand Props.	43/9	—1/3
Geduld	70/-	—1/10½
Govt. Areas	3/6	+1½d
Grootvlei	18/4½	—6d
Hartebeestfontein	40/6	—2/1½
Libanon	6/9	—6d
Luipaards Vlei	9/9	—6d
Marievale	18/1½	—6d
New Kleinfontein	3/1½	—3d
New Pioneer	14/-	—9d
Randfontein	32/9	—2/6
Robinson Deep	7/10½	+1½d
Rose Deep	7/6	—1/-
Simmer & Jack	3/10½	—1½d
S.A. Lands	23/1½	.....
Springs	2/1½	—1½d
Stilfontein	25/-	—9d
Sub Nigel	23/1½	+1/3
Vaal Reefs	28/6	—1/7½
Van Dyk	2/-	—3d
Venterspost	12/6	—4½d
Vlakfontein	16/4½	.....
Vogelstruisbult	12/1½	—3d
West Driefontein	98/9	—3/9

Rand Gold contd.	Price Oct. 31	+ or — on week
W. Rand Consolidated	28/9	—7½d
Western Reefs	27/4½	—6d
O.F.S. Gold		
Freddies	7/6	—6d
Freddies Consolidated	4/-	—1½d
F.S. Geduld	80/-	—6/3
Geoffries	6/7½	—1/6
Harmony	24/10½	—1/1½
Loraine	5/3	—4½d
Lydenburg Estates	15/-	—6d
Merriespruit	4/1½	—1/3
Middle Wits	9/6	—1/3
Ofsits	53/9	—4/9
President Brand	55/7½	—2/6
President Steyn	31/7½	—1/4½
St. Helena	26/10½	—1/1½
Virginia Ord.	8/7½	—7½d
Welkom	15/6	—1/6
Western Holdings	70/-	—3/1½
West African Gold		
Amalgamated Banket	1/4½	.....
Ariston	3/9	.....
Ashanti	15/6	—6d
Bibiani	2/-	—1½d
Bremang	1/3	.....
G.C. Main Reef	1/9	+1½d
Konongo	1/4½	—1½d
Marlu	1½d	.....
Taquah	2/1½	.....
Western Selection	7/4½	—1½d
Australian Gold		
Gold Mines of Kalgoorlie	13/7½	—1½d
Great Boulder Prop.	12/-	.....
Lake View & Star	17/-	+3d
Mount Morgan	17/3	—6d
North Kalgurli	6/9XD	—6d
Sons of Gwalia	2/-	—3d
Western Mining	10/9	—3d
Miscellaneous Gold		
Cam & Motor	7/10½	.....
Champion Reef	12/6	—3d
Falcon Mines	7/9	+4½d
Globe & Phoenix	23/9	+3d
Motapa	10½d	.....
Mysore	3/4½	1½d
Nundydroog	17/1½	7½d
St. John d'El Rey	61/3	—4/3
Zaaa	49/4½	—1/3

Diamonds and Platinum	Price Oct. 31	+ or — on week
Anglo American Inv.	181/3	—2/6
Casts	26/10½	—3d
Cons. Diam. of S.W.A.	11/-	.....
De Beers Defd. Regd.	100/-	—1/3
De Beers Pfd. Regd.	13½	—7/6
Pots Platinum	13/9	—1/3
Waterval	24/-	—1/-
Copper		
Bancroft	48/-	—3d
Chartered	72/-	—1/9
Esperanza	3/1½	—3d
Messina	176/3XD	—16/3
Nchanga	13⅜	+⅜
Rhod. Anglo-American	105/-XD	—7/6
Rhod. Katanga	50/9	—3/3
Rhodesian Selection	46/-XD	—1/-
Rhokana	39XD	—2½
Rio Tinto	82/6	—1/10½
Roan Antelope	25/6XD	—1/6
Selection Trust	91/10½	—7½d
Tanks	151/3	—1/3
Tharsis Sulphur Br.	6½	—½
Tin (Eastern)		
Ayer Hitam	22/6	—3d
Gopeng	11/10½	—1/3
Hongkong	6/7½	.....
Ipoh	29/-	—3/-
Kamunting	10/9	+1½d
Kepong Dredging	4/4½	—3d
Kinto Tin Mines	19/9	—3/3
Malayan Dredging	13/4½	+3d
Pahang	13/10½	—3d
Pengkalen	16/9	—1/3
Petaling	7/9	—3d
Rambutan	27/-	—2/6
Siamese Tin	12/4½	—3d
Southern Kinta	18/7½	.....
S. Malaya	10/10½	+3d
S. Tronoh	7/10½	—6d
Sungei Kinta	18/-	—1/-
Tekka Taiping	7/7½	.....
Tronoh	11/10½	—1½d
Tin (Nigerian and Miscellaneous)		
Amalgamated Tin	10/4½	—1½d
Beralt Tin	46/6	+2/-
Bisichi	4/10½	.....
British Tin Inv.	23/-	—1/4½
Ex-Lands Nigeria	2/1½	.....
Geevor Tin	17/10½	.....

Tin (Nigerian and Miscellaneous) contd.	Price Oct. 31	+ or — on week
Gold & Base Metal	1/1½	.....
Jantar Nigeria	4/9	—1½d
Jos Tin Area	13/9	.....
Kaduna Prospectors	1/6	.....
Kaduna Syndicate	2/-	.....
London Tin	10/4½XD	—1½d
United Tin	1/-	.....
Silver, Lead, Zinc		
Broken Hill South	66/6	—3/-
Burma Mines	4/1½	—1½d
Consol. Zinc	66/3	—6d
Lake George	15/1½	—3d
Mount Isa	26/3	.....
New Broken Hill	50/3	—2/9
North Broken Hill	104/-	—3/-
Rhodesian Broken Hill	11/6	—3d
San Francisco Mines	26/6	—1/6
Uruwira	4/3	—1½d
Miscellaneous Base Metals and Coal		
Amal. Collieries of S.A.	53/9	.....
Associated Manganese	37/9	—2/6
Cape Asbestos	10/3	+3d
C.P. Manganese	25/9	—3d
Consol. Murchison	53/1½	+1/3
Natal Navigation	62/6	.....
Turner & Newall	99/6	—1/10½
Wankie	15/9XD	—1/1½
Witbank Colliery	5½	.....
Canadian Mines		
Dome	$25½	.....
Hollinger	$52	+½
Hudson Bay Mining	$175	+4
International Nickel	$194½	—1½
Mining Corpn. of Canada	£8½	—½
Noranda	$110	—2
Quemont	£8½	—½
Yukon	4/4½	—1½d
Oil		
Apex	42/-	—1/6
Attock	33/9	—9d
British Petroleum	136/3XD	—11/3
Burmah	86/10½	—4/4½
Canadian Eagle	67/9	+2/-
Mexican Eagle	23/6	—6d
Shell	144/4½	—8/4½
T.P.D.	44/6XD	—4/3
Ultramar	51/1½	+1/-

Mining Finance

Aluminium Ltd.—A Dynamic Company in a Dynamic Industry

The growth of the world's aluminium industry has been spectacular and nowhere has this growth been in evidence more than in Canada where Aluminium Ltd., has been adding to its production facilities year by year. It may be recalled that Alcan's 1951-1954 expansion programme absorbed no less than $465,000,000, the expenditure going principally towards bringing its Kitimat plant into operation. This was effected in 1954 when operations began at a rated capacity of 90,000 tons per annum. This proved to be only the end of the beginning as almost immediately after the Kitimat plant was commissioned a further expansion of 60,000 tons was authorized. In 1955 pressure of demand coupled with the company's sales commitments lead to further expansions designed to bring the Kitimat development up to its total " first stage " capacity. Under this 1955 programme additional capacity will be made available over a period extending to 1959 ultimately raising the company's Canadian capacity to approximately 900,000 tons of aluminium a year commencing in 1960. This figure does not, of course, include the company's expansion plans for its plant in Quebec. If this is taken into consideration, the company's total Canadian capacity will reach a figure slightly in excess of 1,000,000 tons annually in 1960 which compares with the capacity output 650,000 tons at the end of 1955.

In addition to physical expansion the company has not overlooked the need for developing the required facilities for the production of primary raw materials —either bauxite or alumina.

In Jamaica the production of alumina, the principal source of Kitimat's supplies, is carried out in a new alumina plant commissioned in 1953 which is being expanded to reach an annual capacity of 55,000 tons by the summer of 1957. Moreover, the company is erecting a second alumina plant there to have a capacity of 250,000 tons a year.

Mr. Nathaniel V. Davis, President of Aluminum Ltd., presented the above information to the Boston Society of Security Analysists last week and went on to say that one way and another the company's capital expenditure programme for the four years 1956-1959 will call for some $500,000,000, or an average of $125,000,000 a year. This new burden of planned expenditures, he said, can be financed to a greater extent than previously from internal resources largely due to the benefits now accruing from past expenditures. Meanwhile, temporary requirements have been met by a medium-term line of credit with several banks which, together with increasing revenues should, it is believed, enable the present construction programme to be completed without further recourse to outside capital.

Justification for such a massive expansion programme the President said, reflecting as it does a feeling of optimism and conviction that the markets will absorb the new output are solidly based. Leaving aside temporary cyclical interruptions or periods of temporary surplus arising from large surges of new production suddenly being made available to the market, consumption trends appears to be strongly upwards.

Since the development of production facilities is a slow process, Mr. Davis declared, planning must be based on a trend basis. For example, in addition to the already well established fields in which aluminium is used demand is developing in the automobile industry and in other important fields such as canning, railroad rolling stock, shipbuilding, and electrical equipment. The development phase for these applications is well advanced and Mr. Davis believes that a strenuous programme of sales and promotion should pay dividends when supplies of aluminium permit such a project.

Referring to current earnings the President was able to say that in the third quarter of this year preliminary estimates showed an improvement in net income by 35 per cent over the third quarter of 1955. As to the near term outlook, however, supply and demand were more in balance now than they had been for some time and thus demand would be more sensitive to smaller adjustments such as those resulting, for example, from changes in inventory policies.

The growth character of Aluminium Ltd. is clearly revealed by the foregoing brief outline of the company's activities. Whether or not the company will be able to participate in the development of the Gold Coast's Volta River scheme without going to the market remains to be seen. If this should be necessary may it not be that the company will seek a quotation on the London Stock Exchange to raise its share of the funds required thereby allowing U.K. investors to hold a direct stake in this dynamic company.

SURPRISE FROM D'EL REY

A great many rumours have been circulating over the past few weeks concerning a possible take-over bid for St. John d'el Rey's mining property in Brazil to develop its iron, gold and other mineral resources. It was generally believed that negotiations to this effect were taking place with a leading American company, and confidence in the rumours were reflected in the strong market for the shares which have been hoisted from 22s. 9d. at the end of June to around 65s. earlier this week.

In the event an announcement dated October 29 from the company has stated that, " Negotiations are in a preliminary stage with a leading American mining company to carry out long-term development, as economic conditions warrant, of the company's iron, gold and other mineral resources, in partnership with the Company." Continuing, St. John d'el Rey's statement declares that " The Board considers that the interests of stockholders would best be served by development of the company's resources in that way rather than by an outright sale of its properties." The immediate market reaction was to mark the shares down to 50s. but a strong and persistent rally set in and after hours on Tuesday the shares closed at 58s. It seems unlikely that the shares would remain at such a high level if only partnership was involved and it may well be that U.S. interests are attempting to gain control by working through the market. In any event, the Guaranty Trust Company of New York is now prepared to accept deposits of St. John d'el Rey ordinary £1 units under the usual conditions for the purpose of issuing American depositary receipts in New York where they will be traded on the " over the counter " market.

UNSETTLED MARKETS

Stock markets have been unsettled on both sides of the Atlantic. Events in Poland and Hungary were dramatic enough to engender nervousness and uncertainty, but when it became known that Britain and France had intervened in the Israel-Egyptian fracas, quotations in the House were marked down all round. This precautionary measure had its effect on discouraging end account selling, although on the week, oil shares have taken quite a hammering. These uncertainties lying as they do close up against the U.S. election next Tuesday knocked the *Dow Jones Industrial Index* down to 479.85 by October 31 from 482.67 on October 24.

Kaffirs, all points considered, have not behaved too badly in spite of the fact that the *F.T. Gold Index* on Wednesday sunk to an all-time low of 72.7. However, the weakness of sterling, which has pushed the official gold price up to 252s. per fine ounce brought in buyers from the Cape and the Continent for some of the older producers. Water troubles at Merriespruit cast a shadow over the newer mines.

The strong, indeed spectacular rises in the prices of base metals, particularly tin and copper, steadied these markets and demand developed for established copper producers.

NO TIME FOR CAMP BIRD

Lest the title of this note be misinterpreted, let us hasten to add that it refers to the plethora of material still coming on to the desk from Camp Bird and the tin companies concerned in the mass take-over bid of 17 Malayan tin companies which has not left sufficient time for us to deal with the situation in time for press this week. However, so far as we have been able to peruse the documents we have no hesitation in referring readers to our views on this question set down in these columns in our issue of September 28 under the title " Cuckoo in the Nest ". In next week's issue the whole question of Camp Bird *vis-à-vis* the tin companies will be reviewed.

FINANCIAL NEWS AND RESULTS IN BRIEF

Harties Commence U_3O_8 Production.—Mr. B. L. Bernstein in his review accompanying the full report and accounts of Hartebeestfontein Gold Mining Company has stated that uranium production will commence this month and that the plant will be operating at its capacity of 100,000 tons a month by January, 1957. To ensure that adequate stope faces will be available to maintain the increased tonnage requirements of the mine, and taking into account a higher rate of sorting, it had now become necessary, Mr. Bernstein said, to proceed with plans for the opening up of the deeper north-western portion of the mine. This will be effected by the sinking of two shafts to the Vaal reef in this area. Referring to the capital, funds raised for gold mining purposes were spent by May last and of the capital expenditure of £1,752,302 involved £366,246 were appropriated from profits. The chairman's statement appears on page 538.

Buffels To Raise Borrowing Powers.—Buffelsfontein Gold Mining are holding an extraordinary meeting in Johannesburg on November 9 to seek shareholders' consent to authorize the directors to raise their borrowing powers from the present limit of £3,000,000 to £8,000,000. This action is considered advisable to allow the company to take advantage of the loans to be made on the usual terms from U.K. and U.S. sources for developing the company's development as a producer of uranium, pyrites and sulphuric acid.

Riebeeck's Issue Terms.—Riebeeck Gold Mining will offer shareholders of Middle Wits one Riebeeck for cash at the par value of 10s. in the ratio of one for 10 Middle Wits. Stockholders of Geoffries are being offered the shares at par on a 6-for-10 basis. The prospectus and provisional allotment letters in respect of these offers will be posted to shareholders of Middle Wits and Geoffries on or about November 26.

Winkelhaak's 313 In. Dwt.—Winkelhaak's No. 3 shaft cut the Kimberley Reef at 1,273 ft. below the collar and sampling round the whole perimeter gave 7.1 dwt. over 44 in., equivalent to 313 in. dwt.

Kennecott Copper's Earnings Well Up.—Kennecott Copper Corporation, the world's largest copper producer, has reported a net income for the first nine months of 1956 of $10.72 a share, compared with $7.58 for the comparable period in 1955. A partial breakdown of earnings showed that income in the third quarter of this year was $2.48 compared with $1.53 in the third quarter of 1955.

Mr. Cox, president, said that with production continuing to exceed sales, the company for the first time in two years, had accumulated a comfortable stock of copper.

U.M.H.K. Raises Interim. — Union Minière du Haut Katanga, the important Belgian Congo metal producer, has announced an increase in the current year's interim dividend to Frs. 700 per share against an interim of Frs. 600 a year ago. This interim will form part of the total dividend for the year ending December 31, 1956, which will be decided at the annual meeting to be held on May 23, 1957. In 1955, the final dividend was Frs. 1,600. U.M.H.K. also states that a second interim distribution may be made in February next. Tanganyika Concessions holds about 180,000 shares in Union Minière.

Falcon's Borehole Gives 3,036 In. Dwt.—A surface borehole put down to test the Pixie orebody some 2,300 ft. north of the Dalny deposit, intersected an orebody averaging 33 dwt. per ton over a true width of 92 in., equivalent to 3,036 in. dwt. This information was disclosed in the September quarterly report of Falcon Mines which also stated that it had been decided to increase the capacity of the Dalny reduction plant from 16,000 tons to 20,000 tons a month. The necessary extensions are expected to be completed by the middle of next year.

Beralt Gets Tax Reduction.—Mr. F. Gates, Chairman of Beralt Tin and Wolfram at the annual meeting (see page 539) said that the major portion of the £154,000 increase in the year's net profit was due to a reduction in the Portuguese export duty on wolfram arising out of a revision of the formula from which the duty is calculated. Mr. Gates' views on the outlook for Wolfram will be found on page 532.

Electro. Zinc Earns More.—Net profits earned by Electrolytic Zinc during the year ended June 30, 1956, moved up to £A2,832,949 from £A2,421,767. The company's dividend was raised from 55 per cent to 65 per cent.

As recently forecast, a new holding company has been formed for Electrolytic Zinc with the name of E.Z. Industries. This company will shortly circularize both preference and ordinary holders of Electrolytic Zinc offering each of them three 10s. shares in E.Z. Industries for each 5s. unit whether preference or ordinary.

Dominion Reefs Maintains Profits.—Operating profits of Dominion Reefs (Klerksdorp) during three months ended September 30, 1956, at £179,185, were virtually unchanged from those of £186,361 in respect of the preceding three months. As before, surplus was struck after deducting interest on uranium loans, but before capital repayments.

Hope for Middlevlei.—Although the debit balance carried forward of Middlevlei Estates at the end of June, 1956, was £40,542, Colonel Broad, chairman, in his annual statement points out that approximately 86 per cent of the issued capital of £286,794 in shares of 2s. 6d. each is still intact and has been invested or is awaiting investment. Middlevlei has a net interest of 5 per cent in any considerations accruing to Johannesburg Consolidated in turning to account the remaining extent of portion "D" of Farm Modderfontein No. 4 in the Vereeniging district.

South Witbank Earns More.—South Witbank Coal mines net profit for the year ended June 30, 1956, was £125,553 (£107,944) after providing for all the usual charges including £44,765 (£35,782) for taxation. Dividend distributions totalling 2s. 3d. per 10s. share on the issued capital of £422,500 required £95,063 (£89,781). Mr. S. Hayden is chairman. Meeting, Johannesburg, November 21.

Eastern Transvaal Pays Same.—Eastern Transvaal Consolidated mines has maintained its dividend at 7½ per cent per 5s. share on the issued capital of £1,079,170. The consolidated profit for the year ended June 30, 1956, was £187,518 (£202,548). The tax liability totalled £600 (credit £79,749). The dividend absorbed £80,938 (same) leaving £163,423 (£158,456) to be carried forward. The annual statement by the chairman, Mr. L. P. Kent, appears on page 538.

T.G.M.E.: Capital Reduction.—Transvaal Gold Mining estates has proposed that its capital should be diminished from £1,000,000 to £952,500. This would be achieved by the cancellation of 47,500 shares of 20s. each which are held in reserve. The reason for this operation is the company's intention to distribute to shareholders its interest in S.A. Forrest investment. Calculations indicate that the most convenient ratio for this distribution was 3 S.A. Forrest investments for every two T.G.M.E. An extraordinary meeting to consider these proposals will be held on November 9 in Johannesburg.

Modder E.'s Klipfontein Corridor.—Modderfontein East's development work in the Klipfontein corridor has proved almost completely negative, according to the annual report now issued.

New Modder's Closure Imminent.—The increasing difficulty in maintaining a payable grade of ore indicates the possible complete cessation of mining in the near future of New Modderfontein Gold Mining Company according to the annual report now issued.

W.M.C. Tests its Lithium.—Mr. G. Lindesay Clarke, chairman, Western Mining Corporation, in his annual statement said that no uranium or oil exploration was undertaken during the year but some preliminary chemical tests were made of the Mount Marion lithium deposits.

New Guinea Gold.—Recommendations to reduce the nominal value of New Guinea Goldfields' 4s. 3d. shares (Australian) to 3s. 9d. (Australian) by returning 6d. per share has been approved by the Australian Equity Court.

Morning Star Calls 1s.—A call of 1s. (Australian) per share on the Morning Star (G.M.A.) 500,000 contributing shares of 4s. each has been made due and payable on November 14.

Shell Trinidad to Move.—Shell Trinidad, formerly United British Oilfields of Trinidad, has now received Treasury consent to transfer control and management to Trinidad and has convened a meeting for November 20 to authorize the change.

Goldfields' Canadian Subsidiary.—New Consolidated Canadian Exploration, a wholly owned subsidiary of Goldfields American Development, which in turn is a subsidiary of New Consolidated Gold Fields, is actively engaged in exploration work on four groups of claims in the Bathurst area of New Brunswick. "Newconex" is carrying out prospecting and geophysical work on 133 claims held under option and the search is concentrated on finding base metals.

Declining Reserves at Cons. Main Reef.—The Directors' Report in respect of Consolidated Main Reef Mines and

Estate for the year ended June 30, 1956, envisages little prospect of developing substantial further tonnages, and the decline in available ore reserves must therefore be expected to continue. This factor coupled with decreasing yield and the greater difficulty of maintaining grade control, would, if circumstances remained unchanged, inevitably lead to a reduction of operations.

Disappointing Disclosures at Luipaards Vlei.—During the first six months of 1956 milling at Luipaards Vlei Estate and Gold Mining Company ran at below capacity. This was due partly to diversion of labour to the Bird Reef section, and partly to difficulties encountered in producing a large proportion of Main Reef ore from numerous small blocks in scattered areas throughout the mine. These difficulties, states the Technical Advisers' report for the year ended June 30, 1956, arose from disappointing disclosures in downward extensions in the south-western area where severe faulting continued to retard development. If faulting now being encountered, the report continued, proves to be associated with Witpoortje Fault, there was little hope of developing any substantial reserves below present workings. In this event gold production would have to rely entirely on irregular blocks, and operations would thus become progressively more difficult and expensive.

Libanon's Higher Grade.—As the result of further improvements in the rate of waste sorting, gold recovery at Libanon Gold Mining rose to 4.4 dwt. during 1955-56 from 4.2 previously. An increase of 1s. 7d. in working costs per ton was thus offset and working profits rose by £22,813.

Development operations beyond the company's north-western boundary ceased during February. But diamond drilling still continues in order to establish the position of the Main Reef subcrop in this area. Development carried out under prospecting permit totalled 270 ft. of which 190 ft. were sampled and 120 ft. (equivalent to 63.2 per cent) were payable having an average 352 in. dwt.

Nigel's Capital Reduction.—At an extraordinary meeting of Nigel Gold Mining Company held earlier this week, a resolution was passed reducing the issued capital from £719,634 10s. to £539,725 17s. 6d. After court confirmation, shareholders will be advised as to the date on which the return of 2s. 6d. per 10s. share in cash will be made.

Outlook for Alcoa.—Despite effects of the August strike, earnings of the Aluminium Company of America for 1956 are expected to exceed the 1955 figure of $4.18 per share. Although an estimated 27,000 ton production loss will be reflected in third quarter earnings, this will be partly offset by increased product prices which came into effect at the end of the strike.

Rukuba's Tin Loss.—A preliminary announcement from Rukuba Tin Mines, whose properties and other assets were sold in July, 1954, revealed a loss for the year ended March 31, 1956, of £1,126, making a total debit balance of £12,621. Meeting, London, November 27.

Stream-Line Filters.—Robert Benson Lonsdale and Co. announce that an offer to purchase the issued capital of Stream-Line Filters at 55s. per 5s. share has been accepted by over 90 per cent of shareholders. The offer has, therefore, become unconditional.

SOUTH AFRICAN COAL ESTATES (WITBANK) LTD.

(Incorporated in the Union of South Africa)

OPENING OF LANDAU NO. 4 MINE PLANNED

MR. T. COULTER'S REVIEW

The thirty-sixth annual general meeting of members of South African Coal Estates (Witbank) Limited will be held on Tuesday, November 27, in Johannesburg.

The following are extracts from the review by the chairman, **Mr. T. Coulter**, which has been circulated to members with the annual report and accounts for the year ended June 30, 1956:—

Accounts

The gross profit on coal mining for the year under review showed a substantial rise to £404,987 from the previous year's figure of £317,475. The main reason for this improvement was the greater profit earned by Landau No. 3 Section of the colliery as a result of the increase in the price of coal granted in November, 1955.

Sundry revenue, dividends and interest amounted to £18,925 and after deducting administration expenses and the loss of £3,713 on Clewer Township a net profit for the year of £405,723 was carried to the appropriation account. This sum with the unappropriated profit of £209,232 carried forward from the previous year and £3,585 appropriated for capital expenditure and now written back, made a total of £618,540 available for appropriation. Taxation provision amounted to £111,615 and directors' additional remuneration was £4,000. Dividends at the rate of 3s. 9d. per share (previous year 3s. 6d. per share) absorbed £187,500. In keeping with the policy announced last year of strengthening the company's financial position to meet new capital expenditure to be incurred in opening up Landau No. 4 Mine in due course, an amount of £200,000 was appropriated for future capital expenditure leaving £115,425 unappropriated to be carried to the balance sheet.

Operations

The sales output of coal for the year under review was 1,706,895 tons, an increase of 94,010 tons over the previous year's output. In addition, despatches of steam coal middlings totalled 171,129 tons. The corresponding figures for the year ended June 30, 1955, were 106,721 tons of middlings plus 22,269 tons of washery discards, equal to 128,990 tons of low grade steam coal.

As a result of representations made to the company by South African Iron and Steel Industrial Corporation Limited, it has been agreed to increase the output of prepared coal at the Navigation Mine from its present level of approximately 500,000 tons to 660,000 tons per annum.

It is planned that such increased output will become effective from January 1, 1959.

Future Mining Policy

After careful consideration of the short and long term demand factors operating in respect of coal consumption in the Union, your directors have come to the conclusion that the best interests of the company would be served if plans were put in hand to open up No. 4 Mine as soon as possible, and so place the company in a position to meet its share of the anticipated increase in the coal trade.

Preliminary work has already been put in hand and it is expected that the new colliery will be in a position to output 70,000/75,000 tons per month on single shift basis during the second half of 1959.

Extensive boring operations already carried out have proved a workable reserve of high grade coal of the order of 70,000,000 sales tons, lying at comparatively shallow depth.

It is estimated that the cost of opening and equipping Landau No. 4 will be in the vicinity of £750,000, and that this sum will be spent over the years 1956/1959.

Capital Expenditure Programme

While the company's financial position is fairly strong, further sums will be required to meet the proposed capital expenditure programme, and it has been decided that these sums should be provided if possible, from the company's own resources.

Provided that operations continue as planned and that our estimates of profit for the next four years are fully realized, it should be possible with the assistance of temporary loan facilities to meet our financial obligations in respect of Landau No. 4 without increasing the issued capital of the company.

Your directors are satisfied that this policy is in the best interests of shareholders, and it is hoped that operating results for the next four years will enable us to avoid having to call upon shareholders to provide additional capital.

This policy will necessitate limiting dividends until Landau No. 4 has been fully established, but it is hoped, notwithstanding the financial requirements of this capital programme, that it will be possible to maintain dividends at their current rate.

From 1959 onwards steam coal output requirements will be met from both Landau No. 3 and Landau No. 4 in suitable proportions. It is calculated, however, that by 1968 the reserves of steam coal in Landau No. 3 will be finally exhausted. The closing down of Landau No. 3 will coincide with the exhaustion of the coking coal reserves at the Navigation pit and Navigation will, therefore, be in a position to assume responsibility for the output requirements of Landau No. 3 from its own considerable reserves of steam coal at the time when Landau No. 3 closes down.

The present arrangement to open Landau No. 4 and the subsequent transfer of Landau No. 3 steam coal trade to Navigation will place the company in a very sound position to meet all probable demands for many years to come.

General

Bituminous coal is still subject to price control and in November, 1955, Transvaal producers received a welcome increase in pithead prices ranging from 2s. 6d. to 3s. per ton for duff coal according to quality, and 1s. 8d. per ton for all other coals.

Copies of the annual report and accounts may be obtained from the London office of the company, 40 Holborn Viaduct, E.C.1.

HARTEBEESTFONTEIN GOLD MINING COMPANY LIMITED

(Incorporated in the Union of S. Africa)

INCREASED TONNAGE MILLED

The seventh annual general meeting of Hartebeestfontein Gold Mining Company Ltd., will be held on November 30 in Johannesburg.

The following is the circulated review of the chairman, **Mr. B. L. Bernstein**:—

I have pleasure in submitting my review of the results achieved at your Company's mine during the the first year of production. The milling rate was increased from 44,000 tons in July, 1955, the first month of production, to 66,000 tons in June, 1956. This was achieved despite a marked increase in the amount of waste rock discarded in sorting operations in stopes and on surface, from 6,000 tons in July, 1955, to 32,000 tons in June, 1956. The grade of ore milled was correspondingly improved and the recovery grade increased from 6.704 dwt. per ton to 9.580 dwt. per ton. Although the high rate of sorting achieved has resulted in a high working cost per ton milled, the trend of working costs is more appropriately reflected in the drop in costs per ounce fine of gold recovered from 178s. 2d. in July, 1955, to 137s. 9d. in June, 1956.

Further improvement has been effected since the close of the year and during the first quarter of the current year a working profit including sundry revenue, of £578,075 was derived from the milling of 201,000 tons at a recovery grade of 9.75 dwt. per ton. Working costs averaged 65s. 9d. per ton milled, equivalent to 134s. 10d. per ounce fine recovered.

Faulting has continued to influence the amount of development footage required to open up the eastern area for stoping. If this is taken into consideration, the ore reserve of 1,636,000 tons, available for stoping, is satisfactory. In addition, the values exposed in development have continued to be encouraging. In this connection I would like to draw attention to the resue now being carried out. This practice will result in a temporary reduction in the footage sampled but will ensure a higher grade and smaller tonnage of development ore sent to the mill.

Extensions to the Reduction Plant to bring the capacity to 66,000 tons per month, have been completed and a third milling unit is now being installed to bring the rated capacity of the plant up to approximately 90,000 tons per month. It is proposed to provide additional capacity at a later date.

Uranium

The erection of the uranium plant, which was started in September, 1955, was sufficiently advanced to permit of the commencement of plant testing in September, 1956. It is anticipated that the production of uranium will be commenced in November, 1956, and that the plant will be operating to its capacity of 100,000 tons per month in January, 1957. Until such time as the rate of production of current slimes reaches the full capacity of the uranium plant, supplementary tonnages will be provided from slime accumulated from past operations.

In order to ensure that adequate stope faces will be available to maintain the tonnage requirements of the mine, taking into account a high rate of sorting, it has now become necessary to proceed with plans for the opening up of the deeper north-western portion of the mine. It has, therefore, been decided to sink two shafts to the Vaal Reef in this area. No. 2A sub-vertical Shaft has been sited 400 feet south-east of No. 2 Shaft (which, as shareholders are aware, is situated in the deeper portion of the mine), and will be sunk from the transfer level at a depth of 3,096 feet to a depth of approximately 6,300 feet below surface. No. 3 vertical Shaft which has been sited near the mine's northern boundary, east of No. 2 Shaft and north of No. 1 Shaft, will be sunk to a depth of approximately 5,700 feet. This shaft will serve to expedite the exploitation of the deeper area and will become the main upcast ventilation shaft. No. 3 Shaft has been sunk to a depth of 90 feet below the surface and the shaft collar is under construction. Work on the haulage connections, engine chambers and rope races for No. 2A Shaft is in progress. Full scale sinking operations are expected to be commenced in May, 1957, as soon as permanent winders are commissioned.

Finance From Own Resources

The capital funds raised for gold mining purposes were spent by May, 1956, and of the capital expenditure of £1,752,302 for the year, £366,246 was appropriated from profits. It is anticipated that future capital expenditure on gold mining will be financed out of profits without affecting the capacity of the Company to distribute dividends.

The total profit for the year amounted £1,426,592 and after appropriating £366,246 for capital expenditure, £250,977 for repayment of loans and £450,000 for the payment of Dividend No. 1 of 10%, there remained a balance of £359,369 which was carried forward to the current financial year.

This concludes my review of the year's operations and I desire to place on record your Board's appreciation of the services rendered by the Manager of the Mine, Mr. G. S. de Villiers, and his staff, as well as the staff at both the Head and London Offices of the Company.

EASTERN TRANSVAAL CONSOLIDATED MINES, LIMITED

(Incorporated in the Union of S. Africa)

MR. L. P. KENT'S REVIEW OF OPERATIONS

The thirty-first Annual General Meeting of the Eastern Transvaal Consolidated Mines, Limited, will be held in Anglovaal House, Johannesburg, on Thursday, November 22, 1956, at 10.45 a.m. The following is the review by the Chairman, **Mr. L. P. Kent**, of the salient features of the operations for the year ended June 30, 1956:—

The total profit earned by all branches of your Company during the year ended June 30, 1956, amounted to £180,338 as compared with £200,282 for the previous year, which latter figure included an extraneous amount of £10,500 by way of an insurance claim. The Company's mining activities during the year resulted in a profit of £181,060, being a small decrease compared with the previous year.

Capital Expenditure for the year amounted to £75,700.

In order to ensure continuity of power supplies, the capacity of the power station at the New Consort Mine is to be increased by the installation of a further 3,000 kW. steam turbine generating plant. Work has been commenced on foundations and on extensions to the existing cooling pond.

At the Agnes Mine the sinking of the Cesca sub-vertical shaft from the 17th level, the elevation of the Ben Lomond Tunnel, is proceeding satisfactorily. The shaft is being sunk to facilitate the exploitation of the deeper levels of the Ivy Main Shoot where encouraging values have been obtained down to the 19th level.

Unless adequate tonnages of payable ore are disclosed in the old Mamre section recently reopened, it will be necessary to suspend operations at the Mamre Mine in the near future.

The Pneumoconiosis Act

The Pneumoconiosis Act, which was gazetted recently, may have serious effects on your Company's mining operations. It is now required that all Natives employed in dusty occupations have radiographical and clinical examinations on engagement and discharge and also at six-monthly intervals during the period of employment. It is anticipated that this procedure may have adverse effects on working costs and on the availability of Native labour. The additional current liability will be of the order of £400 per month; as yet the Company has no means of estimating the additional retrospective liability that will also become payable.

The Company has been advised by the Native Affairs Department that it is proposed to implement the requirements of the Native Labour Regulation Act, 1911, and the Native Administration Act, 1927. These regulations have the effect, inter alia, of limiting the number of married Natives that can be accommodated on mines and apart from the adverse effect on the availability of Native labour will require expenditure on further accommodation for single Natives.

Your Company's subsidiary, Frantzina's Rust Timber Plantations, Limited, increased its profit from £2,442 to £7,655 during the year under review.

Despite adverse weather conditions during the year farming operations carried out by your Company resulted in a profit.

I desire to take this opportunity of placing on record your Board's appreciation of the services rendered by our General Manager, Mr. C. B. Genis, and by the managers, staffs and employees of our various mines and branches.

BERALT TIN & WOLFRAM

MR. F. GATES REVIEWS THE POSITION

The 28th annual general meeting of Beralt Tin and Wolfram, Ltd., was held on October 25 at Winchester House, London, E.C.

Mr. F. Gates (Chairman) presided.

The Chairman, in the course of his speech, said: I think you will agree that the accounts for the year ended March 31 last call for little detailed comment.

The Balance Sheet continues to show a strong financial position with net current assets higher by some £100,000 than at the end of the previous year, but the plans for extending the scope of Company's mining operations to which I shall refer later will, if they develop satisfactorily, entail heavy expenditure and the cash resources built up during recent years will stand the Company in good stead.

The Board have thought it prudent, having regard to the anticipated cost of equipping and developing the recently acquired tin-bearing property mentioned in their Report, to make an allocation of £100,000 in the accounts under review to a Reserve account but, if the new mine develops as we hope, expenditure well in excess of that amount will ultimately be required.

Taxation

Net profit before U.K. taxation for the year under review shows an increase of £154,000 over the figure for the previous year. The greater part of this was accounted for by a reduction in Portuguese export duty arising out of revision of the formula on the basis of which the duty is calculated. The revision took place in November, 1954, and was, therefore, applicable to the whole of the year under review.

You will have noted that during the debate on the 1956 Finance Bill, the Chancellor promised to look carefully into the possibility of introducing legislation in next year's Finance Bill to give effect to the Royal Commission's recommendation that profits earned by companies overseas which are not distributed should be exempt from U.K. taxation. Legislation on these lines would afford the Company welcome relief of its present onerous tax burden, but we regard it as no less important that the taxation borne by the Company in Portugal should be admitted by the Inland Revenue for double tax relief.

Wolfram Prices and Production

The highest market price for wolfram during the Company's financial year was 277/6 per unit; in April, 1955, it was as low as 207/-. Nevertheless, thanks to the one outstanding contract at a substantially higher price for a monthly quota of about 40 tons, which continues until end-September, 1957, and to sales at premium prices reflecting the exceptional quality of the Company's concentrates, an average price of 291/- per unit was realized for the year's sales.

Production costs per ton of concentrates were slightly higher than the exceptionally low figure for the previous year, but lower than for any other year since the devaluation of sterling in 1949. Having regard to the considerable rise during recent years in the price of materials and to some increase in the Portuguese wage level, we consider it an outstanding achievement, for which the Company is much indebted to its Consulting Engineer, Mr. J. C. Allan, and its General Manager, Mr. G. A. Smith, that production costs should have been held steady over the last seven years. That could not have been accomplished without the maintenance of high standards of efficiency in the mine and the two mills and readiness at all times to test new techniques and to introduce them into the Company's operations when proved.

The greater part of the Company's production still comes from the block of ground east of the main fault between main adit level and Level 1 some 200 feet lower, and you will remember that at our last meeting I said that this block contained sufficient ore to meet requirements for some years to come. I mentioned also at that meeting that work on Level 2, 325 feet below Level 1, had confirmed the continuity of well mineralized veins to that depth.

We then expected that it would soon be necessary to commence working downwards from Level 1, but, in the meantime, diamond drilling and underground workings west of the fault have disclosed veins of good grade wolfram over an extensive area outside the bounds of what we formerly regarded as our main mine, not only between main adit level and Level 1, but also above the former level. We are now planning to stope this area and, since it is desirable to exhaust the higher levels first, it seems unlikely that we shall be extracting ore from the block of ground between Levels 1 and 2 for a number of years to come.

Extension of Mining Interests

As you were informed in the Directors' Report, we recently bought a tin property which lies between our mining concession and Fundao, and have already commenced driving and diamond drilling on it. If the deposit persists in depth as we hope, really substantial expenditure will be required for erection of a mill and other buildings with the plant and equipment needed for an operation of this nature.

General Outlook for the Wolfram Market

Notwithstanding our efforts to extend the scope of the Company's activities to other minerals, the fact remains that for the present we must continue to be largely dependent for our prosperity on the price of wolfram, and that obviously is subject to many influences outside our control.

I reminded you last year of the "mercurial possibilities" of wolfram (of the ups and downs of which I have had such long experience), whilst at the same time expressing confidence in the immediate outlook. That confidence has been justified by the strength and relative stability of the market until recent weeks, when there has been some weakening. There is no doubt that supply and demand are at present in somewhat delicate equipoise, due to the substantial rise in world production which has been artificially stimulated by Governmental action since 1950.

But whether or no there is some further temporary price recession, Beralt is in a strong competitive position as a large efficient and low-cost producer of concentrates which have a world-wide reputation for high tungsten content and comparative freedom from impurities. Moreover, our finances are now in healthier shape than ever before—a most important factor.

We are thus well equipped to face the future. It is my personal belief that over the years the demand for tungsten will increase, due to the development of new techniques and the expanding requirements of the steel industry all over the world; and in my opinion all these considerations g.ve ground for confidence in the long-term outlook.

The report and accounts were adopted.

ORES AND MINERALS. London Company with mining interests abroad requires the services of capable, hard-working, ambitious gentleman with sound experience in ores and good connections to end-users, particularly of Chromium Ores. First-class prospects, with share of profits offered to successful applicant. Please write full particulars, past experience and salary required, to Box 586, The Mining Journal, 15 Wilson Street, London, E.C.2.

THE BOARD OF TRADE has for disposal about 406 long tons Australian Rutile Sand (minimum 95 per cent TiO_2) packed in bags, lying in store in N rth Wales.

Any material, the subject of this offer, purchased from the Board must not be re-exported from the United Kingdom but must be consumed in the United Kingdom and not elsewhere.

Full particulars and forms of tender (returnable by November 22, 1956) may be obtained on application to the Board of Trade, C. and G 7.(B), Room 317 Lacon House, Theobalds Road, London, W.C.1. (Telephone Chancery 4411, Ext. 329 (330).

UNIVERSITY OF LONDON

IMPERIAL COLLEGE OF SCIENCE AND TECHNOLOGY

ROYAL SCHOOL OF MINES

Applications are invited for the post of Lecturer in Mineral Dressing. Candidates should possess an Hons. Degree, preferably in Engineering Metallurgy or in Mining. Practical ore dressing experience is desirable. Salary on scale £700 x 50—£1,000 x 50—1,400, with point of entry dependent on qualifications and experience. F.S.S.U. and family allowances. Candidates in addition to teaching, would be expected to undertake research. Post vacant mid-1957. Applications to Head of Mining Department, Imperial College, London, S.W.7, stating age, qualifications and experience together with the names of two referees, not later than February 28, 1957.

Professional Directory

Aerophysics of Canada Ltd.
Airborne Electromagnetic Surveys

Also offering integrated services in all branches of aerial and ground exploration

74 Sparks Street, Ottawa, Canada
CEntral 2-5315

139 Bond Avenue, Don Mills, Ontario
HIckory 4-4451

CATALYTIC
CONSTRUCTION OF CANADA, LIMITED

Designers - Consultants - Constructors
— FOR THE —
Mining Industries

900 YONGE ST., TORONTO, ONT.
600 S. VIDAL ST., SARNIA, ONT.
430 MARIEN AVENUE, MONTREAL EAST, P.Q.

F. H. JOWSEY LIMITED
Mining Consultants
Management Exploration Financing
Suite 324 - 12 Richmond St. E.,
TORONTO, CANADA
Telephone: EMpire 8-4651

SIDNEY S. ALDERMAN, Jr.
CONSULTING GEOLOGIST
814 Newhouse Building,
Salt Lake City 11, Utah
Telephone: ELgin 9-0976

HOPKINS EXPLORATION CONSULTANTS
Mining Engineers, Geologists and Geophysicists
Room 607, 320 Bay Street,
Toronto 1, Canada
EM-4-5642 Phones: HU-9-8375

C. T. SWEET, A.C.S.M., M.I.M.M.
KNAPP & BATES LTD.
Ore Dressing Engineers
Africa House, Kingsway,
London, W.C.2
Tel.: CHA 6770
Cables: Flowsheet, London

IAN BAIN
GEOLOGIST, P.ENG.
9316 - 86th Street,
Edmonton, Alberta, Canada
Phone: 65383

HUNTING TECHNICAL SERVICES LIMITED
SPECIALISTS IN GEOLOGICAL MAPPING
6 Elstree Way,
Boreham Wood, Herts.
Telephone: Elstree 2214.
Cables: Hunteco, London.
London Office:
4, Albemarle Street, London, W.1.

R. A. Mackay. G. A. Schnellmann
MACKAY & SCHNELLMANN
Geological and Mining Consultants
115 MOORGATE, LONDON, E.C.2.
Cables: Pyrochlore, London.
Tel: Monarch 5177/8.

A. S. BAYNE,
B.Sc., P.Eng.
CONSULTING ENGINEER
2 Toronto Street,
Toronto, Canada
Telephones: EM 8-8056 & MA 6793

A. W. JOHNSTON
Geologist, P.Eng.
16th Floor
100 Adelaide Street West,
TORONTO 1
Phone EM. 3-1493

McPHAR GEOPHYSICS LIMITED
Geological, Geochemical, and Geophysical Surveys
Offering comprehensive exploration facilities and property management service
139 Bond Avenue, Don Mills,
Ontario, Canada
Phone: HIckory 4-4451

JOHN A'C. BERGNE
Mining Engineer
The White House
Eashing, Godalming
Surrey
Tel: Godalming 1894

FRANC. R. JOUBIN & ASSOCIATES
P. Eng., Ont. & B.C.
Consulting Geologists
619-68 Yonge Street,
Toronto, Ont., Canada

ARTHUR NOTMAN
Consulting Mining Engineer
55 Liberty Street, 18th Floor,
New York 5, N.Y., U.S.A.
Telephone: BArclay 7-9484

POWELL DUFFRYN TECHNICAL SERVICES LIMITED
Consulting Engineers
(Mining, Chemical, Industrial)
Technical Buying Agents
19, Berkeley Street, London, W.1.
Cables: Technicoal. Phone: GRO. 3801

Trem. Watson Metallurgists
Mining and Metallurgical Engineers, Samplers
430 Victoria Ave., Chatswood, Sydney
Telegraphic: "METALLURGIST," Sydney
Telephones: JA 4187 JX 3334
Australia and S.W. Pacific Area

AGENCE MINIÈRE ET MARITIME S A
2, RUE VAN BREE - ANTWERP - BELGIUM
Sworn weighers, samplers of ores, metals and residues.
Agents for shippers at European ports and plants.
Telegrams: Rentiers-Antwerp Telex 1[illegible]3

MARK G. SMERCHANSKI
CONSULTING MINING GEOLOGIST
(Registered Mining Engineer)
411 CHILDS BLDG., WINNIPEG, MANITOBA
Telephone: 926323

Spartan Air Services Ltd.
and
Canadian Aero Service Ltd.
Operators of Canada's largest aerial survey fleet. All types airborne geophysical surveys. Topographic mapping. Helicopter services.
348 Queen Street, Ottawa
Telephone: CEntral 2-5315

TECHNICAL SERVICE LABORATORIES
SPECTROGRAPHIC ANALYSIS
CHEMICAL RADIOMETRIC
Low Cost General Analysis
Accurate Analysis of Ores—Radioactive Base and Precious Geochemical Analysis
Mill and Plant Control
22 HARBORD STREET WAlnut 4-0767
TORONTO (5), ONT.
Member: Association of Canadian Testing Laboratories

LEO H. TIMMINS, P.Eng.
Mining Engineer
Examinations, Reports, Financing of Prospects
Suite 700, 1980 Sherbrooke West, Montreal, 25, Quebec, Canada
Phone: Glenview 2376
Cable: TIMCONS

W.W. VARVILL,
M.Sc., M.I.M.M
Consulting Mining Engineer.
British Lead-Zinc Mining.
Inglewood, Runfold, Farnham, Surrey
Tel.: Runfold 486

This feature will appear every fourth week.

IN THE HIGH COURT OF JUSTICE 1956 — H — No. 1339
CHANCERY DIVISION GROUP A.

IN THE MATTER of The Mines (Working Facilities and Support) Acts 1923 and 1925 the Mining Industry Act 1926
and
The Mines (Working Facilities) Act 1934
and
IN THE MATTER of the Application of HALKYN DISTRICT UNITED MINES LIMITED

NOTICE IS HEREBY GIVEN that an Application has been made by Halkyn District United Mines Limited (hereinafter called "the Applicants") to the Minister of Fuel and Power and referred to the High Court of Justice pursuant to the provisions of Sections 1, 3 and 5 of the above Mines (Working Facilities and Support) Act 1923 for the Grant to the Applicants of the following rights namely :—

(*a*) the right to work all mines veins seams beds and deposits of land lead ore blende calamine black jack and zinc ores and other metalliferous minerals and all other mines and minerals gotten therewith under certain lands in the parishes of Cilcain and of Halkyn and Mold Rural in the County of Flint and also within the Parish of Llanferres in the County of Denbigh

(*b*) the right by underground workings only to search for work win get raise and carry away and dispose of any adjacent or other mines (hereinafter referred to as "the adjacent mines") of which the Applicants are or may become the owners lessees or occupiers from through or by means of the mines under the said lands and any pits shafts levels tunnels drifts roads or works therein or thereto belonging or for the time being used in connection therewith

(*c*) the right by underground workings only to enter upon the said lands or any part thereof and to occupy so much thereof as the Applicants shall deem necessary or expedient and through and under the said lands or any part or parts thereof to deepen widen enlarge improve alter maintain and use all or any existing openings levels tunnels drifts roads water-courses and other works and conveniences and to open dig sink drive make erect maintain and use such openings levels tunnels drifts roads watercourses machinery plant works and appliances and to perform and to do all such other acts and things as shall from time to time be necessary convenient or expedient for most effectually and advantageously searching for working winning getting raising unwatering ventilating carrying away and disposing of the said mines and the adjacent mines and the produce and products thereof or any other minerals and substances

(*d*) the right by underground workings only to have free ingress agress and regress with or without all tools plant vehicles and equipment into through and from the said lands or any part or parts thereof and to make maintain and use beneath the surface of the said lands any necessary or convenient underground workings whatsoever

AND NOTICE IS HEREBY FURTHER GIVEN that should the said rights be granted by the Court to the Applicants in accordance with the said Application the Applicants will accept liability to make or pay such sum or sums by way of compensation as the Court shall determine to be made or paid to the owners or other persons interested in the land in respect of which the rights are granted by the Court.

AND NOTICE IS HEREBY FURTHER GIVEN that any Public Authority or body or Corporation or person having any objection to the grant to the Applicants of the rights applied for must give notice in writing on or before 1st January 1957 to the Applicants' Solicitors London Agents Messrs. Lovell, Son & Pitfield, 5 Verulam Buildings, Gray's Inn, London, W.C.1 and such notice shall contain :

1. The name and address of the Objector.
2. A statement of the capacity in which the Objector is interested and particulars of any land or other rights or interests in respect of which objection is made.
3. The ground of such objection.

AND NOTICE IS HEREBY FURTHER GIVEN that copies of the Originating Summons of the Applicants in this matter dated 25th May 1956 of the said Application to the Minister of Fuel and Power and of two Affidavits of Reginald Alan Alldred and of plans showing the areas of the proposed workings and the lands affected thereby have been deposited at the registered office of the Applicants at 8 Great Winchester Street London E.C.2 at the regional office of the applicants at Bryn Awel Halkyn near Holywell in the County of Flint at the office of Messrs. Walker, Smith & Way at 26 Nicholas Street Chester and at the offices of Messrs. Lovell, Son & Pitfield at 5 Verulam Buildings Gray's Inn London W.C.1 and may be inspected at any time during business hours and copies thereof and extracts therefrom may be taken by any person interested.

DATED the 11th day of October 1956.

JAMES S. NEAVE,
Master.

LOVELL, SON & PITFIELD, 5 Verulam Buildings, Gray's Inn, London, W.C.1. Agents for WALKER, SMITH & WAY, Chester, Applicants' Solicitors.

Made from tough-as-steel fibreglass and thermo-setting polyester resin, the "Toughguard" is the only fibreglass helmet which is supplied with the new Panorama patented polythene adjustable harness. This ingenious permanent harness completely out-modes the standard leather type which calls for frequent replacement. Because of its ingenious design it fits into a standard sized helmet—yet is so adjusted that it will fit any head from size 6½ to 8. The Panorama "Toughguard" exceeds all Government specifications for impact, penetration, etc., and is now being tested to American Federal specifications.

NEW PANORAMA "TOUGHGUARD" FIBREGLASS MINERS HELMET with Polythene Adjustable Harness

★ *Easy to wear — lightweight, comfortable, cool and ventilated.*

★ *No metal parts — special polythene suspension.*

★ *Water, mildew and fungus-proof.*

★ *High dielectric resistance.*

★ *Replacement of harness never necessary; easily sterilized.*

★ *One size for all heads—saving time and inventory keeping.*

★ *Available in white, black, red, green, grey and yellow; no chinstrap needed.*

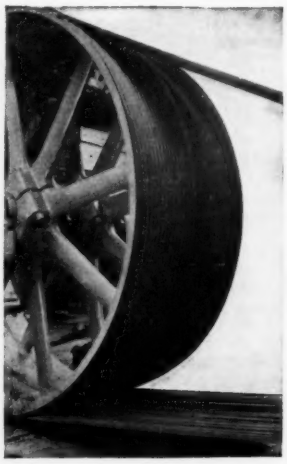
★ *Can also be supplied fitted with miner's lamp brackets and cable clips.*

Descriptive leaflets will gladly be sent on request

PANORAMA

PANORAMA EQUIPMENT LIMITED,
Panorama House, 29/36 Seymour Mews, Wigmore St., London, W.1.
WELbeck 2871

WIGGLESWORTHS
for POWER TRANSMISSION EQUIPMENT



Makers of
"TEXROPE"
V
DRIVES

PROVED BEST BY TEST

FRANK WIGGLESWORTH & CO. LTD.
ENGINEERS
SHIPLEY YORKSHIRE

WOLVERHAMPTON DIAMOND DIE & TOOL Co. Ltd.

BOARTS
and
INDUSTRIAL DIAMONDS
Exporters

11 HATTON GARDEN,
LONDON, E.C.I.
Telephone: HOLborn 3017 *Cables:* Pardimon, London

The Wheat from the chaff

Separation of the wanted from the unwanted — this, by definition, is refining, whatever the material concerned.

No such operation demands a greater degree of care and control than the refining of the precious metals — and nowhere is this process carried out with more skill and experience than at Johnson Matthey.

The largest of their kind in Europe, and probably the most comprehensive in the world, the Johnson Matthey refineries are equipped to handle the bulk treatment of bullion, ores, concentrates and mining by-products containing gold, silver or the platinum metals.

Johnson Matthey

MELTERS AND ASSAYERS TO THE BANK OF ENGLAND

JOHNSON, MATTHEY & CO., LIMITED · HATTON GARDEN · LONDON · E.C.1.

Telephone: HOLborn 6989

I.R.I

Metal and Mineral Trades

Established 1797 *Members of the London Metal Exchange*

DERBY & CO. LTD.

11-12 ST. SWITHIN'S LANE, E.C.4.

Telephone: MINCING LANE 5272

Specialists in

WOLFRAM, SCHEELITE, CHROME, MOLYBDENITE, TANTALITE, COLUMBITE RUTILE, ILMENITE, BERYL, ZIRCON AND OTHER MINERALS

Smelters and Refiners of

GOLD, SILVER, PLATINUM, PALLADIUM, OSMIUM, IRIDIUM, ETC.

Buyers of

MINERALS, ORES, CONCENTRATES, SWEEPS, LEMELS AND RESIDUES containing GOLD, SILVER, PLATINUM, COPPER, TIN, ZINC, LEAD

Smelting and Refining Works:
BRIMSDOWN, MIDDLESEX

Also at:
NEW YORK :: ADELAIDE
JOHANNESBURG
SALISBURY (Rhodesia)

MEMBERS OF THE LONDON METAL EXCHANGE

LEONARD COHEN LTD.

PRECIOUS METALS

ELECTROLYTIC COPPER WIREBARS & CATHODES
TIN — LEAD — ZINC
NON-FERROUS METAL INGOTS
ORES — CONCENTRATES — SCRAP METALS

London Office:
1 HAY HILL, W.1
Telephone: **GROSVENOR 6284**

Works:
PORTH, GLAM.
Telephone: **PORTH 280**

ENTORES, LIMITED
CITY WALL HOUSE, 14-24, FINSBURY STREET, LONDON, E.C.2.

NON-FERROUS METALS
ORES · RESIDUES

Telegrams: Entores, Phone, London
Telephone: MONarch 6050
Telex No: London 8455

EASTERN SMELTING CO. LTD.

Head Office: **ST. SWITHIN'S HOUSE, 11/12 ST. SWITHIN'S LANE, LONDON, E.C.4**
Telephone: MANsion House 2164/8 *Telegrams:* TIMAMASA, PHONE LONDON
Smelting Works: PENANG, FEDERATION OF MALAYA

TIN SMELTERS

BRANCHES THROUGHOUT THE FEDERATION OF MALAYA

Sole Selling Agents: **VIVIAN, YOUNGER & BOND, LIMITED, PRINCES HOUSE, 95 GRESHAM STREET, LONDON, E.C.2**
Telephone: MONARCH 7221/7
Telex: LONDON 8665
Telegrams: BOND, STOCK, LONDON
Cables: BOND, LONDON

we buy
CONCENTRATES
ORES RESIDUES
containing
Base and Precious
METALS

E. M. JACOB & CO. LTD.
Members of the London Metal Exchange
GREENWICH HOUSE, 10-13 NEWGATE ST., LONDON, E.C.1
Telephone: CITy 8401 (7 lines) *Cables:* JACOMETA, LONDON
Telex No: LONDON 8655

ROKKER & STANTON LTD.
DRAYTON HOUSE, GORDON STREET
LONDON, W.C.1
Metal Stockists & Shippers
for
BRASS, COPPER, ALUMINIUM
AND NICKEL SILVER
in
Sheets, Rods, Tubes, Strip, Wire, etc.
Associated Companies in Holland and Belgium also Regd. in South Africa and Rhodesia
Tel: EUS 4751/2 Cables: BENTLEY 2nd, A.B.C.6
Grams: ROKKER, WESTCENT, LONDON

MINING & CHEMICAL PRODUCTS LIMITED
86 Strand
London WC2
Telephone
Temple Bar
6511/3
Buyers of Ores, Concentrates and Residues of
BISMUTH
INDIUM
SELENIUM

EVERITT & Co. LTD.
Teleg. Address: Persistent, Liverpool
40 CHAPEL STREET
LIVERPOOL
Phone: 2995 Central
SPECIALITY
MANGANESE PEROXIDE ORES,
We are buyers of :—
WOLFRAM, SCHEELITE, MOLYBDENITE
VANADIUM, ILMENITE, RUTILE,
ZIRCONIUM and TANTALITE ORES
Suppliers of :—
FERRO-ALLOYS & METALS NON-FERROUS ALLOYS

THE STRAITS TRADING
COMPANY, LIMITED
Head Office:
P.O. Box 700, OCEAN BUILDING, SINGAPORE
Works:
SINGAPORE & PENANG
"The Straits Trading Co., Ltd."
Brand of Straits Tin

GEORGE T. HOLLOWAY Co. LTD.
Metallurgists & Assayers
ORE TESTING, WORKS AND METALLURGICAL
RESEARCH LABORATORIES
Atlas Road, Victoria Road, Acton,
LONDON, N.W.10
Telephone: ELGAR 5202
Grams and Cables: NEOLITHIC LONDON

THE BRITISH TIN SMELTING
COMPANY, LIMITED
Works: LITHERLAND, LIVERPOOL
Smelters of Non-ferrous Residues and Scrap
London Agents:
W. E. MOULSDALE & CO., LTD.
2 Chantrey House, Eccleston Street, London, S.W.1
Cables: Wemoulance, London Telephone: SLOane 7288/9

ZINC SHAVINGS
GRANULATED & POWDERED
NON-FERROUS METALS

"Lead Wool" for Pipe-jointing.
Metallic Packing for Pumps, etc.

THE LEAD WOOL CO., LTD.
SNODLAND **KENT**
Telephone: Snodland 516/7 Telegrams: "Strength, Phone, Snodland"

J. & J. MAYBANK LTD.

This Company backed with the vast experience gained in a 100 YEARS of progressive trading, will expedite all orders . . .

THE BUYING OF MIXED OR SORTED NON-FERROUS SCRAP METALS and Supplying of Finely Graded Non-Ferrous Scrap to Your Requirements

J. & J. MAYBANK LTD.

DEPTFORD WHARF, GREENWICH HIGH ROAD, LONDON, S.E.10. **Telephone : TIDeway 5351 (10 lines)**

J. LOWENSTEIN & CO. LTD.
GREENWICH HOUSE,
10/13 NEWGATE STREET, LONDON, E.C.1
Telephone : City 8401 (7 lines)
ORES - METALS - RESIDUES

CUPELS
MAGNESIA CUPELS and ASSAY MATERIAL "MABOR" BRAND, as supplied to MINTS, MINES and ASSAYERS throughout the World.
MABOR (1944) LIMITED
(Founded 1900)
THE PIONEERS OF MAGNESIA CUPELS
Registered Office : 310 Winchester House, London, E.C.2
Phone : London Wall 5089 *Tel. Address :* Maborlim, London
Agencies : SALEM, INDIA : MONTREAL, CANADA : PERTH, W.A.
Supplies through Agents, the Trade, or direct.

Contractors for Ores · Concentrates & Residues *containing*
LEAD
ZINC · COPPER · ANTIMONY · WOLFRAM
LEOPOLD LAZARUS LTD.
CITY WALL HOUSE, 79/83 CHISWELL ST., LONDON, E.C.1
Telephone: METROPOLITAN 8831 Cables: ORMINLAZ, LONDON
OFFICES AT SYDNEY, CALCUTTA AND JOHANNESBURG

International Smelters and Buyers of
NON-FERROUS
SCRAP METALS AND RESIDUES
TIN
LEAD
WHITEMETAL
SOLDER
GUNMETAL
COPPER
THE EYRE SMELTING CO LTD
Tandem Works, Merton Abbey, London, S.W.19
Phone : Mitcham 2031 Wire : Eyrsmeltin, Phone, London

Cables: Alreco, London *Telephone:* Trafalgar 5922 (8 lines) *Telex:* 2-2462
ALRECO METAL CORPORATION LTD.
(Members of the London Metal Exchange)
ORES :: MINERALS
RESIDUES METAL ALLOYS
SEMI-FINISHED
NON-FERROUS METAL PRODUCTS
1-3 ROBERT STREET, LONDON, W.C.2.
OFFICES AT NEW YORK AND BRUSSELS

SPANISH VIRGIN
QUICKSILVER
(Mercury)
Spanish Virgin Quicksilver produced at the world famous Almaden Mine is renowned for its consistent high purity
Representatives for British Commonwealth and other countries
ELDER, SMITH & CO., LIMITED
3, ST. HELEN'S PLACE, LONDON, E.C.3.
Phone: LONdon Wall 5201 (8 lines) Cables: BARRELDER, LONDON

ESSEX METALLURGICAL
METALLURGICAL (ESSEX) LTD.
(F. L. Jameson, A.M.I.M.M., E. G. Parker)
Assayers and Samplers
On London Metal Exchange List of assayers and samplers
Laboratories and Offices:
13 Woodhouse Grove, London, E.12
Telephone : GRAngewood 4364
Grams : Assaycury, Forgate, London Cables : Assaycury, London

DEERING PRODUCTS LTD.
8 GREAT SMITH STREET, LONDON, S.W.1
ORES - MINERALS - REFRACTORY RAW MATERIALS
Telephone : ABBEY 2681/2 Cables : PRODEERING, LONDON

HENEAGE METALS
for Quality Ingots IN BRASS, GUN METAL & PHOSPHOR BRONZE.
PHONE ASTON CROSS 1177/8
HENEAGE METALS Ltd. HENEAGE St. BIRMINGHAM.

CHARLES KERRIDGE
● SCRAP LEAD ● BATTERY PLATES
● COPPER CABLES ● NON-FERROUS CONTENTS
FENCEPIECE ROAD, CHIGWELL, ESSEX
Telephones : Hainault 2903 Larkswood 3863 Telegrams : Metallia East Phone London

MAP OF THE KLERKSDORP FIELD

✱While a mine is at the development stage, it is of vital importance to have a visual picture of its position in relation to the field as a whole. Otherwise the quarterly results published by the companies lose much of their significance.

✱Results reported from adjacent mines often have a direct bearing on the one in which you are interested, which, however, can only become apparent if you have clearly in mind the position of all the properties in relation to one another.

✱*The Technical Map Service*, located in Johannesburg, performs this service most effectively, for the Klerksdorp field. This map and its accompanying statistical handbook show :—

—the exact position of each mine on the field
—where in each property boreholes have been or are being sunk, how far they have gone and what the core recovery has been on reef intersection
—what shafts are being sunk, how far they have gone and what the final depth is expected to be.

Obtainable in London from

The Mining Journal

Price 25s. paper; 35s. linen
(plus 1s. postage)

METAL TRADERS LTD.
7 GRACECHURCH ST., LONDON, E.C.3
Telegrams : Serolatem, Stock, London Telex No : London 2-2610 Telephone : MANsion House 2544

Buyers and Sellers of
NON-FERROUS METALS
ORES AND MINERALS

New York Associates :
Metal Traders Inc., 67 Wall Street

BROOKSIDE METAL CO. LTD.
(Owned by Metal Traders Ltd.)
HONEYPOT LANE, STANMORE, MIDDX.
Telegrams : Aluminium, Stanmore Telephone : EDGware 5544

Buyers and Sellers of
NON-FERROUS SCRAP METALS

Specialists in
COPPER-BEARING MATERIALS

Wanted Regular Shipments

METALLURGICAL LOW GRADE

CHROME ORE
MINIMUM 41% CR203
MINIMUM 2.6 : 1 CR/FE RATIO

ALSO

SCHEELITE
TUNGSTEN ORE

●

COSMO METAL ALLOYS CORPORATION
ESTABLISHED 1895

Office : 150 Broadway, New York 38, N.Y.
Platt: 597-603 Kent Avenue, Brooklyn, 11, N.Y.
Cable Address : 'EDELORIOUS'

MACHINERY & EQUIPMENT DIRECTORY

Buyers will find the addresses of the companies listed below in the advertisement pages of our recent issues. Alternatively, enquiries may be addressed to *The Mining Journal*, 15 Wilson Street, London, E.C.2. Phone : MONarch 2567.

AGITATORS
Denver Equipment Co. Ltd.

BALL MILLS
Fraser & Chalmers Eng'g Wks.

BALL MILL LINERS
Hadfields Ltd.

BALLS FOR MILLS
Brindley (F. J.) & Sons (Sheffield) Ltd.

BATTERIES
Britannia Batteries Ltd.

BEARINGS
British Timken Ltd.

BELTING — RUBBER & FIRE RESISTANT
British Belting & Asbestos Ltd.
British Tyre & Rubber Co. Ltd.
Rubber Improvement Ltd.
U.S. Rubber International (G.B.) Ltd.

BOREHOLE & DRILLING CONTRACTORS
Conrad Stork Hijsch. N.V.
Craelius Co. Ltd.
Thom (John) Ltd.

BRAKE & CLUTCH LININGS
British Belting & Asbestos Ltd.
Small & Parkes Ltd.
Trist (Hubert H. P.) & Co. Ltd.

CABLES
British Insulated Callender's Cables Ltd.
Edison Swan Electric Co. Ltd.

CABLEWAYS & ROPEWAYS
Ceretti & Tanfani Ropeway Co. Ltd.

CALCINING PLANT
Fraser & Chalmers Eng'g Wks.

CASTINGS
Hadfields Ltd.

CEMENTATION
Cementation Co. Ltd.

CHEMICALS
I.C.I. (Gen. Chem. Div.)

CLASSIFIERS
Denver Equipment Co. Ltd.
Head, Wrightson & Co. Ltd.
Holman Bros. Ltd.

CLUTCHES — FRICTION
British Belting & Asbestos Ltd.
Small & Parkes Ltd.
Trist (Hubert H. P.) & Co. Ltd.
Wigglesworth (F.) & Co. Ltd.

COAL BREAKERS
Hadfields Ltd.

COAL CUTTERS
Joy-Sullivan Ltd.

COAL WASHING PLANT
Fraser & Chalmers Eng'g Wks.
Head Wrightson & Co. Ltd.

COMPRESSORS — AIR
Atlas Copco AB.
Holman Bros. Ltd.
Lead Wool Co. Ltd.
Mackay Industrial Equipment Ltd.
Ward (Thos. W.) Ltd.

CONCENTRATING TABLES
Davies Magnet Works Ltd.
Fraser & Chalmers Eng'g Wks.
Holman Bros. Ltd.
Knapp & Bates Ltd.

CONCRETE MIXERS
Ransomes & Rapier Ltd.

CONVEYORS
Birtley Co. Ltd.
Broadbent (Robt.) & Son Ltd.
Cable Belt Ltd.
Fraser & Chalmers Eng'g Wks.
Head Wrightson & Co. Ltd.
Mitchell Engineering Ltd.
Wood (Hugh) & Co. Ltd.

CRANES
Ward (Thos. W.) Ltd.

CRAWLER TRACTORS
Mackay Industrial Equipment Ltd.
Marshall Sons & Co. Ltd.

CRUSHERS — JAW
Broadbent (Robt.) & Son Ltd.
Fraser & Chalmers Eng'g Wks.
Hadfields Ltd.
Nordberg M'f'g. Co.
Sheepbridge Eng'g Ltd.

CRUSHERS — GYRATORY
Hadfields Ltd.
Nordberg M'f'g. Co.
Sheepbridge Eng'g Ltd.

CYANIDE PLANTS
Denver Equipment Co. Ltd.
Fraser & Chalmers Eng'g Wks.
Knapp & Bates Ltd.

DIAMONDS — INDUSTRIAL
Smit (J. K.) & Sons Ltd.
Van Moppes (L. M.) & Sons Ltd.
Wolverhampton Diamond Die & Tool Co. Ltd.

DRAGLINE BUCKETS
Hadfields Ltd.
Ruston-Bucyrus Ltd.

DREDGE BUCKETS
Hadfields Ltd.

DRILL BITS — DETACHABLE
Holman Bros. Ltd.
Rip Bits Ltd.

DRILL BITS — DIAMOND
Craelius Co. Ltd.
Smit (J. K.) & Sons Ltd.
Van Moppes (L. M.) & Sons Ltd.

DRILL RIGS
Conrad Stork Hijsch. N.V.
Joy-Sullivan Ltd.
Ruston Bucyrus Ltd.
Mitchell Engineering Ltd.

DRILL RODS
Holman Bros. Ltd.
Rip Bits Ltd.
Wood (Hugh) & Co. Ltd.

DRILL SHARPENERS
Holman Bros. Ltd.

DRILL STEEL
Brindley (F. J.) & Sons (Sheffield) Ltd.
Hadfields Ltd.

DRILLS — DIAMOND & CORE
Craelius Co. Ltd.
Joy-Sullivan Ltd.
Smit (J. K.) & Sons Ltd.

DRILLS — PROSPECTING
Conrad Stork Hijsch. N.V.
Mitchell Engineering Ltd.
Ruston Bucyrus Ltd.

DRILLS — ROCK
Atlas Copco AB.
Holman Bros. Ltd.
Ruston-Bucyrus Ltd.
Wood (Hugh) & Co. Ltd.

EARTH MOVING EQUIPMENT
Blackwood Hodge (J.) & Co. Ltd.
Marshall Sons & Co. Ltd.
Premier Plant & Hire Co. Ltd.
Ward (Thos. W.) Ltd.

ELECTRIC MOTOR & CONTROL GEAR
British Thomson-Houston Co. Ltd.
General Electric Co. Ltd.
Metropolitan-Vickers Electrical Co. Ltd.

ELECTRICAL SWITCHGEAR
British Thomson-Houston Co. Ltd.
General Electric Co. Ltd.
Metropolitan-Vickers Electrical Co. Ltd.
Wood (Hugh) & Co. Ltd.

ELECTRICAL PRECIPITATION
Lodge Cottrell Ltd.

EXCAVATORS
Blackwood Hodge (J.) & Co. Ltd.
Premier Plant and Hire Co. Ltd.
Ransomes & Rapier Ltd.
Ruston Bucyrus Ltd.

EXPLOSIVES — BLASTING
I.C.I. (Nobel Division)

FILTERS
Denver Equipment Co. Ltd.

FILTERS — LUBRICATING OILS
Stream-Line Filters Ltd.

FILTERS — SWITCH & TRANSFORMER OIL
Stream-Line Filters Ltd.

FIRE EXTINGUISHERS
Pyrene Co. Ltd.

FLEXIBLE JOINTS
The Unicone Co. Ltd.

FLOTATION EQUIPMENT
Denver Equipment Co. Ltd.
Fraser & Chalmers Eng'g Wks.
Huntington, Heberlein & Co. Ltd.
Knapp & Bates Ltd.

FLOTATION REAGENTS
I.C.I. (Gen. Chem. Div.)
National Chemical Products Ltd.

FOUNDATIONS
Cementation Co. Ltd.

FURNACES
Huntington-Heberlein & Co. Ltd.

GEOPHYSICAL INSTRUMENTS
Hilger & Watts Ltd.

GEOPHYSICAL & GEOLOGICAL SURVEYS
Craelius Co. Ltd.
Thom (John) Ltd.

GRINDING PANS
Fraser & Chalmers Eng'g Wks.
Holman Bros. Ltd.

HANDLING PLANT
Birtley Co. Ltd.
Head Wrightson & Co. Ltd.
Mitchell Engineering Ltd.

HAULAGE GEAR
Austin Hopkinson & Co. Ltd.
Holman Bros. Ltd.
Metropolitan-Vickers Electrical Co. Ltd.
Robey & Co. Ltd.

HELMETS
Helmets Ltd.
Panorama Equipment Ltd.
Safety Products Ltd.
Siebe Gorman & Co. Ltd.

HOISTS
Austin Hopkinson & Co. Ltd.
Fraser & Chalmers Eng'g Wks.
Holman Bros. Ltd.

HOSE — RUBBER
British Tyre & Rubber Co. Ltd.
U.S. Rubber International (G.B.) Ltd.

LIGHTING EQUIPMENT
Edison Swan Electric Co. Ltd.
General Electric Co. Ltd.
Metropolitan-Vickers Electrical Co.

LOCOMOTIVES — DIESEL
Ruston & Hornsby Ltd.
Wood (Hugh) & Co. Ltd.

LOCOMOTIVES — ELECTRIC
British Thomson-Houston Co. Ltd.
Metropolitan-Vickers Electrical Co. Ltd.

MAGNETIC SEPARATORS
Davies Magnetic Works Ltd.
Huntington, Heberlein & Co. Ltd.
Rapid Magnetic Machines Ltd.

MAGNETS-ELECTRO LIFTING
Rapid Magnetic Machines Ltd.

MINE CARS
The Distington Eng'g Co. Ltd.

MINE CAR — WHEELS & AXLES
Hadfields Ltd.

MINERS' LAMPS
Premier Lamp & Eng'g Co. Ltd.

PICKS — PNEUMATIC
Atlas Copco AB.
Holman Bros. Ltd.
Wood (Hugh) & Co. Ltd.

PLANT — HIRE
Premier Plant & Hire Co. Ltd.
Ward (Thos. W.) Ltd.

POLYVINYL CHLORIDE RESIN
British Geon Ltd.

PUMPING EQUIPMENT
Comet Pump & Eng'g Co. Ltd.
Fraser & Chalmers Eng'g Wks.
Ward (Thos. W.) Ltd.

PUMPS — CENTRIFUGAL
Comet Pump & Eng'g Co. Ltd.
Fraser & Chalmers Eng'g Wks.
Ward (Thos. W.) Ltd.

PUMPS — SAND
Denver Equipment Co. Ltd.
Fraser & Chalmers Eng'g Wks.

PUMPS — SINKING
Thom (John) Ltd.

RADIOACTIVE ORE DETECTOR
Ekco Electronics Ltd.

RAILWAY PLANT & EQUIPMENT
Jones (Wm.) Ltd.
Ward (Thos. W.) Ltd.

RESPIRATORS
Siebe Gorman & Co. Ltd.

ROOF BOLTING EQUIPMENT
Holman Bros. Ltd.
Rawlplug Co. Ltd. (The)

ROOF SUPPORTS
Dowty Mining Equipment Ltd.

RUBBER PRODUCTS
British Tyre & Rubber Co. Ltd.
Rubber Improvement Ltd.
U.S. Rubber International (G.B.) Ltd

SAFETY EQUIPMENT
Helmets Ltd.
Panorama Equipment Ltd.
Safety Products Ltd.
Siebe Gorman & Co. Ltd.

SCRAPER HAULAGE
Austin Hopkinson & Co. Ltd.
Holman Bros. Ltd.
Wood (Hugh) & Co. Ltd.

SCRAPER LOADERS
Atlas Copco AB.
Eimco (Great Britain) Ltd.
Joy-Sullivan Ltd.

SCREENING PLANT
Broadbent (Robt.) & Son Ltd.
Davies Magnet Wks. Ltd.
Fraser & Chalmers Eng'g Wks.
Nordberg M'f'g Co. Ltd.

SHAFT SINKING
Cementation Co. Ltd.

SHOVEL LOADERS
Atlas Copco AB.
Eimco (Great Britain) Ltd.
Joy-Sullivan Ltd.

SURVEYING INSTRUMENTS
Hilger & Watts Ltd.

TEST SIEVE VIBRATOR
The Pascall Eng'g Co. Ltd.

THICKENERS
Denver Equipment Co. Ltd.

TIMBER PRESERVATIVES
Hickson's Timber Impregnation Co. (G.B.) Ltd.

TRANSFORMERS
British Thomson-Houston Co. Ltd.
General Electric Co. Ltd.
Metropolitan-Vickers Electrical Co. Ltd.

TUBE MILL LINERS
Hadfields Ltd.

VEE-ROPE DRIVES
Wigglesworth (F.) & Co. Ltd.

VENTILATION HOSE
British Tyre & Rubber Co. Ltd.
Flexible Ducting Ltd.
Rubber Improvement Ltd.

WATER SUPPLY EQUIPMENT
Thom (John) Ltd.

WELDING
Cementation Co. Ltd.

WELDING ELECTRODES
Metropolitan-Vickers Electrical Co. Ltd.

WELDING EQUIPMENT
British Insulated Callender's Cables Ltd.
Lincoln Electric Co. Ltd.
Metropolitan-Vickers Electrical Co. Ltd.

WIRE ROPE & ACCESSORIES
British Ropes Ltd.

WINDING EQUIPMENT — ELECTRIC
British Thomson-Houston Co. Ltd.
General Electric Co. Ltd.
Metropolitan-Vickers Electrical Co. Ltd.
Robey & Co. Ltd.

always in the market...

Smelters and Refiners of Non-ferrous Metals for over 100 years.

Always in the market—both as buyers and sellers.

Members of the London Metal Exchange.

selling

antimonial lead alloys for the battery trade . . .

cable alloys to all specifications . . .

refined soft pig lead . . .

lead for equipment in radioactive work . . .

lead and tin powders . . .

SOLDERS—Ingot, stick, solid and cored wire, washers, preforms, etc. . . .

Fluxes and solder paint . . .

BUYERS FROM ENTHOVEN can rely on obtaining products to exact specifications processed under strict laboratory control.

buying

battery plates . . .

lead drosses and skimmings . . .

lead concentrates . . .

scrap and remelted lead . . .

scrap solder and white metals . . .

scrap type metal . . .

scrap tin . . .

residues . . .

SELLERS TO ENTHOVEN can rely on a ready acceptance of material—whatever the state of the market.

H. J. ENTHOVEN & SONS LTD.

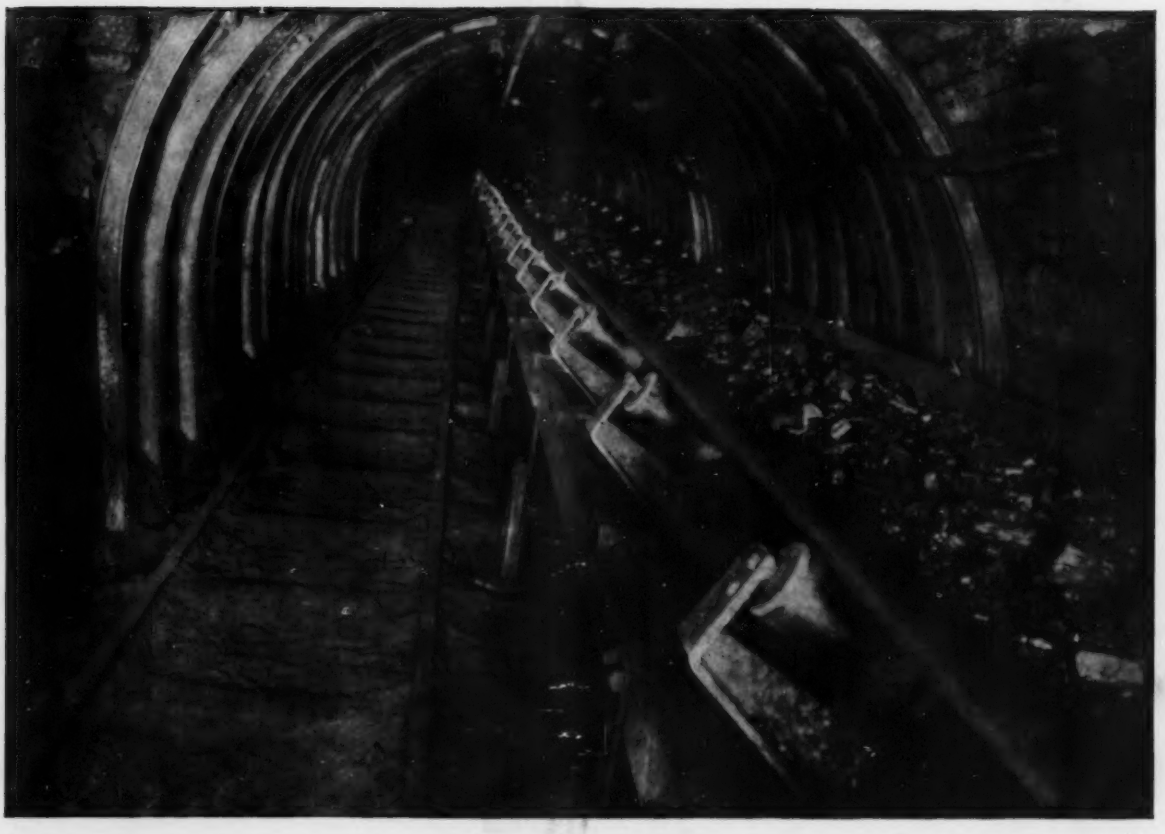
Head Office.
Enthoven House, 89, Upper Thames Street, London, E.C.4.

Telephone: MANsion House 4533.

Telegrams: Enthoven Phone London.

SMELTERS AT ROTHERHITHE LONDON AND DARLEY DALE DERBYSHIRE

Huwood



The large trunk conveyor shown above illustrates both good theory and good practice. It is built up of open structure to facilitate inspection. The structure is raised to keep the return belt clear of the floor. It is fitted throughout with Huwood Oil-filled Idler Rollers, and all belt joints are vulcanized. The conveyor is approximately 1400 yards long, is driven by a 60 h.p. G.T.B. Drive Head, the belt being 42 inches in width.

This conveyor has now carried approximately three million tons and is still in excellent condition.

HEAD OFFICE & FACTORIES:
Telegrams: HUWOOD, GATESHEAD.

HUGH WOOD & CO., LTD., GATESHEAD-ON-TYNE, 11
Telephone: LOW FELL 76083 (5 lines).

Industrial and Export Office:
Telegrams: HUWOOD AVE, LONDON.

DASHWOOD HOUSE, 69 OLD BROAD STREET, LONDON, E.C.2.
Telephone: LONdon Wall 6631-2-3.

Published by The Mining Journal Ltd., 15 Wilson Street, Moorgate, London, E.C.2, and printed by Washburn & Sons Ltd., Queens Road, Southend-on-Sea, Essex. Registered as a Newspaper.